

**ANNOTATED STATE AND COUNTY CHECKLIST OF THE MOSSES OF WYOMING,
PART 1, A–L**

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ABSTRACT

This state and county checklist of the species of mosses known for Wyoming includes literature reports, lists of representative specimens examined, taxonomic and floristic annotations, and illustrations from the Flora of North America volumes 27 and 28. The account includes 380 species plus seven varieties.

Past checklists of the mosses of the state of Wyoming include those of Nelson (1900), Porter (1937, unpublished dissertation), and Eckel (1996). Additional papers of floristic importance are listed in the Wyoming Mosses Bibliography. A detailed summary of collecting activity and early floristic publications is given by Eckel (1996).

Continuing work on the state flora since 1996 by many bryologists and recent changes in classification introduced with the Flora of North America (FNA 2007, 2014) make a new compilation worthwhile. The most recent checklist of Eckel (1996) included 290 species plus 25 varieties, while the present list cites 380 species plus seven varieties. This reflects both new work and less emphasis on infraspecific taxa by authors of treatments in the Flora of North America.

The nomenclature follows that of the Flora of North America. Synonyms, largely from that work, are provided to help interpret names on specimens. The entries include a paragraph for nomenclature, another referencing the literature including discussion of geographic distribution largely based on information given by FNA and by Lawton (1971), a third paragraph citing specimens examined by myself, and a fourth with discussion. Herbarium citations are standard. Synonymy associated with prior lists is helpfully interspersed in Roman typeface. A left-aligned bar introduces new generic names.

Illustrations from volumes 27 and 28 of the Flora of North America (FNA 2007, 2014) are provided for many of the taxa in this list with the approval of the FNA Association. All of these were drawn by myself as illustrator of these two volumes.

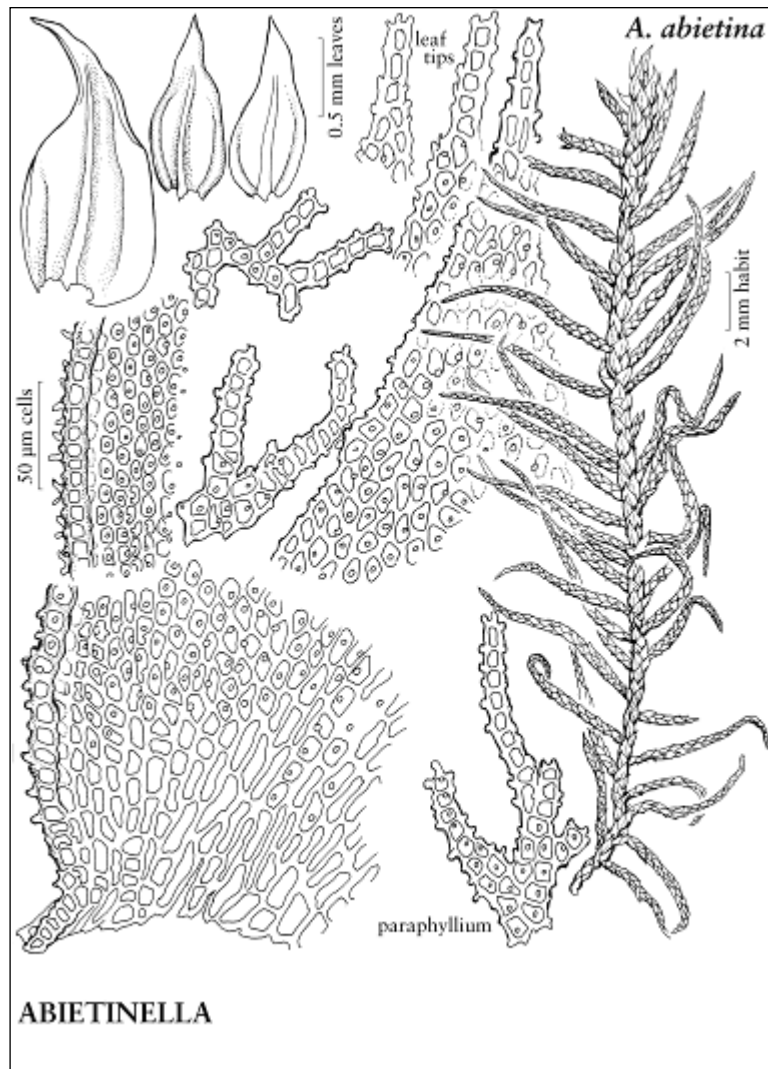
ABIETINELLA Müll. Hal., Nuovo Giorn. Bot. Ital., n.s. 3: 115. 1896. (Thuidiaceae)
Thuidium sect. *Abietina* Schimp.
Thuidium subg. *Abietinella* (Müll. Hal.) Broth.

Abietinella abietina (Hedw.) Fleischer, Musc. Buitenzorg 4: 1497. 1923.
Hypnum abietinum Hedw., Sp. Musc. Frond., 353 (added post-publ.). 1801.
Thuidium abietinum (Hedw.) B.S.G.

Wyoming; “Unlike *Thuidium*, *Abietinella* is papillose on both leaf surfaces rather than just the back” (W. R. Buck in FNA 28, 2014). Hawk’s Ranch, Colorado-Wyoming State line, Albany

County (Nelson in 1930); Tower Falls, Yellowstone Natl Park (collector unknown), Porter (1935). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Johnson Co.: Big Horn Mts., 5500 ft, *Odasz 1217* (BUF, RM). Park Co.: 6000 ft, *s.n. 13064* (RM, BUF); 6300–6900 ft, *21985* (BUF, RM). Sheridan Co.: Mineral soil, conifer litter, Big Horn Natl Forest, T57N, R89W, Sect. 28, 17 Jun 1992, *McGee 92-033* (BUF, RM). Weston Co.: Newcastle, on ground in open pine forest, 19 Jul 1942, *Degener 17,010* (NY). Yellowstone Natl Park: Beaver dams, Camp Roosevelt, 1924, *Conard VI*, c.fr. (NY).



Courtesy FNA Association, FNA 28, 2014

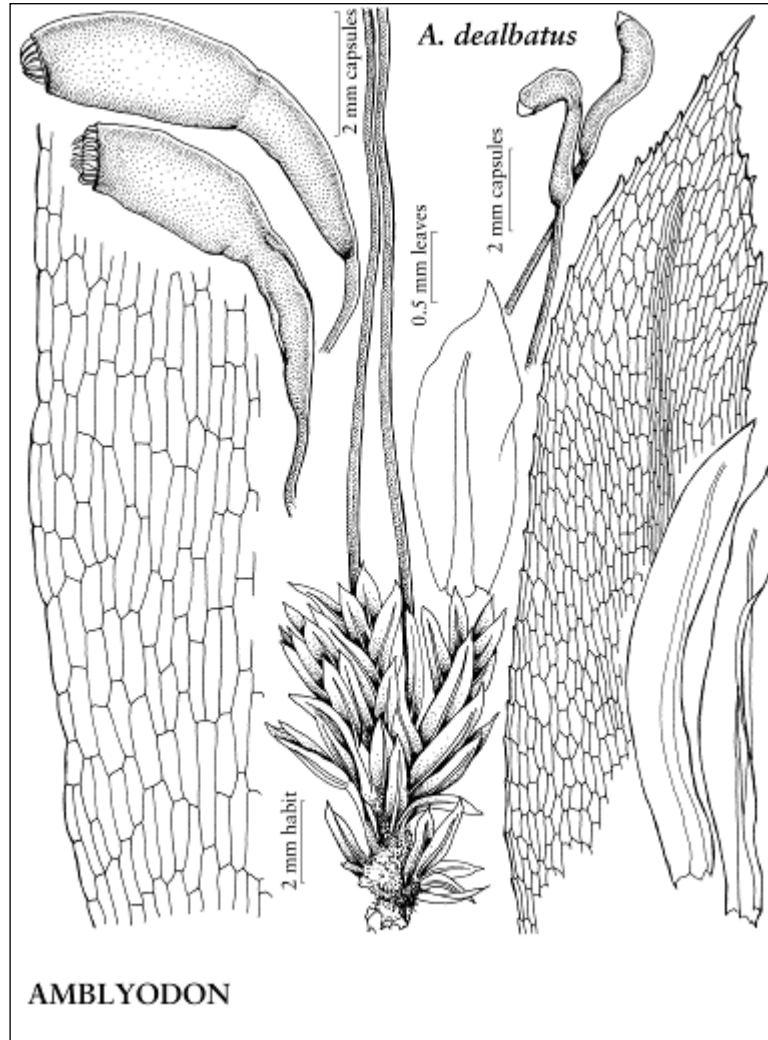
AMBLYODON P.-Beauv., Mag. Encycl. 5: 323. 1804 (as *Amblyodum*), name and orthography conserved. (Meesiaceae).

Amblyodon dealbatus (Hedw.) P.-Beauv. in F. Cuvier, Dict. Sci. Nat. 2: 23. 1804 (as *Amblyodum dealbatum*).

Meesia dealbata Hedw., Sp. Musc. Frond., 174, plate 41, figs. 6–9. 1801.

Wyoming (FNA 28, 2014). Springy and boggy places, in the Ferris Mountains, Carbon Co. (Nelson 4976), Porter (1935). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Park Co.: S slope of Bear Tooth Butte, 23 Aug 1953, Lawton 2057 c.fr. (WTU).



Courtesy FNA Association, FNA 28, 2014

Amblystegium riparium (Hedw.) Schimp. = *Leptodictyum riparium* (Hedw.) Warnst.

AMBLYSTEGIUM Schimper in P. Bruch and W.P. Schimper, *Bryol. Europ.* 6: 45, plates 561–566, 568–573. 1853. (Amblystegiaceae)

Amblystegium serpens (Hedw.) Schimp. in P. Bruch and W.P. Schimper, *Bryol. Europ.* 6: 53. 1853.
Hypnum serpens Hedw., *Sp. Musc. Frond.*, 268. 1801.
Amblystegium juratzkanum Schimper
Amblystegium serpens var. *juratzkanum* (Schimper) Rau & Hervey

Wyoming (FNA Vol. 28, 2014). (As var. *serpens*.) Wyoming: Yellowstone Natl Park (1550b–1552) (Roell 1893). Yellowstone is the type locality for *A. serpens* subspecies *schlotthaueri*

Ren. & Card. (1550) described in Roell (1893). (As *Amblystegium schlotthaueri* (Ren. et Card.) Par. = *A. serpens* (Hedw.) BSG fid. Cheney, Bot. Gaz. 24:241. 1897.) “on wet rocks in Yellowstone Nat. Park, Wyom.” (Roell 1893). Albany, Carbon Cos., Yellowstone Natl Park, Porter (1935). Teton Co., Spence (1985). Campbell Co., Medina (1994). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: “Laramie Hills” Nelson 1929 (RM); Medicine Bow Mts., Medicine Bow Natl Forest, Barber Lake Picnic Area, 2.5 air mi NW of Centennial, *Pinus contorta* forest along Libby Creek, 2660 m, Buck 23189 (NY); NW base Sheep Mtn. along WY Rte. 11, ca. 4 mi 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, wet rotting log, Reese 18173 (LAF, BUF). Park Co.: wet marly substrate, in calcareous fen at base of Cathedral Cliffs, 2 mi E of Crandall Ranger Station, 6,600 ft, Elliott 1738 (BUF).

(As var. *juratzkanum*) Albany, Carbon, (Sublette, Teton Cos.), Yellowstone Natl Park, Porter (1935).

Albany Co.: 8,000 ft, Porter 1541 (RM). Carbon Co.: Ferris Mts., 25 Jul 1898, Nelson 4979 (RM). Fremont Co.: 8600 ft, Hermann 25307 (RM). Yellowstone Natl Park: grassy seep, swale, roots of *Salix*, 6,239 ft, a few mi from Mammoth Hot Springs on Road to Tower, 6 Jul 1995, Eckel 95082823, with *Brachythecium frigidum*, *Aulacomnium palustre*, *Bryoerythrophyllum recurvirostrum*, *Bryum pseudotriquetrum* var. *bimum*, *Distichium capillaceum*, *Drepanocladus aduncus* & *D. uncinatus*, *Leptobryum pyriforme*, *Plagiomnium rugicum*, *Plagiothecium denticulatum* (BUF).

Platydictya (costae not evident or very short), *Platygyrium* (costa short and double), and *Pterigynandrum* (costa short and double), and *Pylaisiella* (costae short and double) are similar. *Amblystegium serpens* and varieties and variations always have a costa strong to at least the middle of the leaf. Especially gracile forms may be misleading.

Amblystegium tenax (Hedw.) C. Jens. = *Hygroamblystegium varium* (Hedw.) Mönk. subsp. *varium*

Amblystegium trichopodium (Schultz) Hartm. = *Hygroamblystegium varium* (Hedw.) Mönk. subsp. *varium*

Amblystegium varium (Hedw.) Lindb. = *Hygroamblystegium varium* (Hedw.) Mönk., s.l.; q.v.

AMPHIDIUM Schimper, Coroll. Bryol. Eur., 39. 1856, name conserved. (Orthotrichaceae)

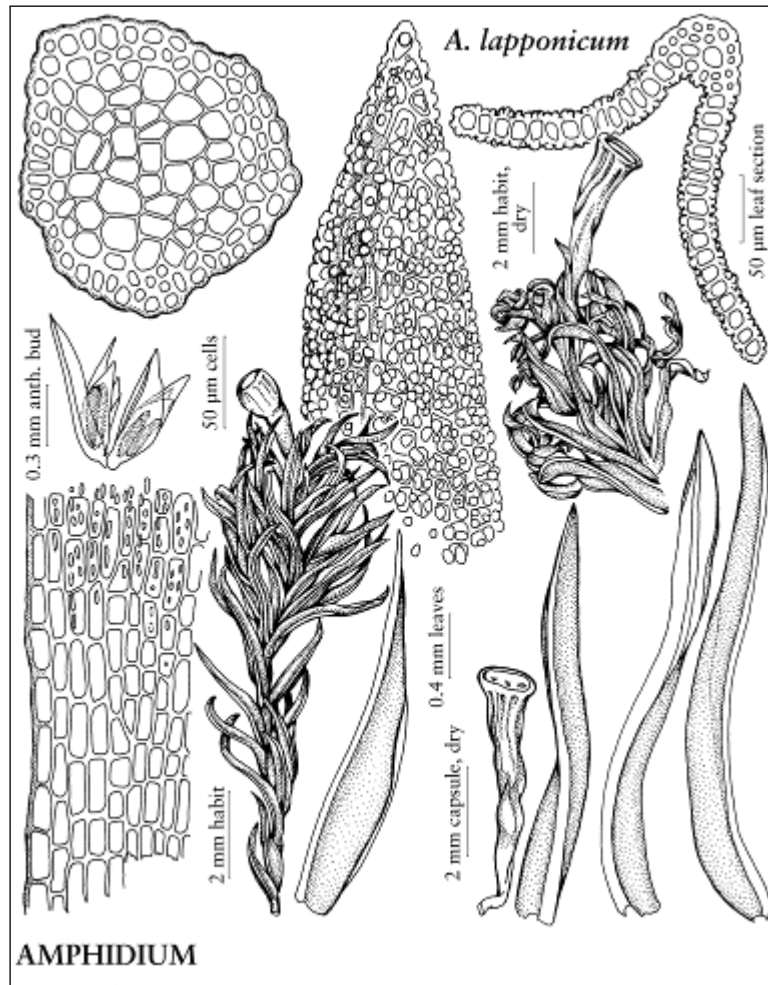
Amphidium lapponicum (Hedw.) Schimp., Coroll. Bryol. Eur., 39. 1856.

Anictangium lapponicum Hedw., Sp. Musc. Frond., 40. 1801 (Hedw.) Schimp.

Wyoming (FNA Vol. 28, 2014).

(As *Amphoridium lapponicum* Sch.) Wyoming: Yellowstone Natl Park, Upper Falls (1460, 1472), Roell (1893). Albany County (Porter 1738); Johnson Co. (Porter 1624), Porter (1935). Teton Co., Spence (1985).

Sublette Co.: 10,348 ft, Rolson 85117 (CSU).



Courtesy FNA Association, FNA 28, 2014

ANACOLIA W.P. Schimper, Syn. Musc. Eur. ed. 2, C, 513. 1876, name conserved. (Bartramiaceae)

Anacolia menziesii (Turner) Paris, Actes Soc. Linn. Bordeaux, sér. 5, 6: 37. 1894 (as menziezii).

Bartramia menziesii Turner, Ann. Bot. (König & Sims) 1: 525, plate 11, fig. 1. 1805.

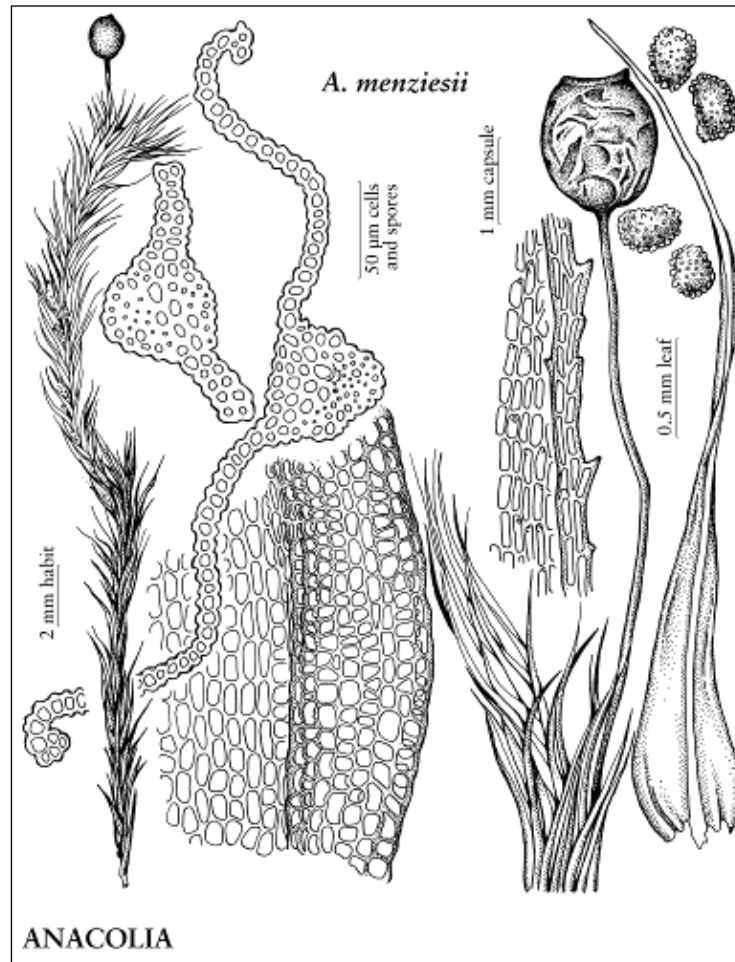
Anacolia menziesii var. *baueri* (Hampe) Paris

Bartramia menziesii Turner

Wyoming (FNA Vol. 28, 2014). Wyoming, Lawton (1971). Wyoming, Flowers (1973).

Yellowstone Natl Park: Firehole River S of Madison Junction, 18 Aug 1953, *Lawton 1875* (WTU).

In the Eckel (1996) checklist there is a var. *baueri* (Hampe) Flow.



Courtesy FNA Association, FNA 28, 2014

ANDREAEA Hedw., Sp. Musc. Frond., 47. 1801. (Andreaeaceae)

Andreaea rupestris Hedw., Sp. Musc. Frond., 47, plate 7, fig. 2g–o. 1801.

Andreaea petrophila Fuernr.

NOTE: there numerous synonyms in FNA Vol. 28, 2014.

Reported for Wyoming (errata, FNA Vol. 28, 2014).

Yellowstone Natl Park: Lost Lake, *Lawton 1830* (YELLO).

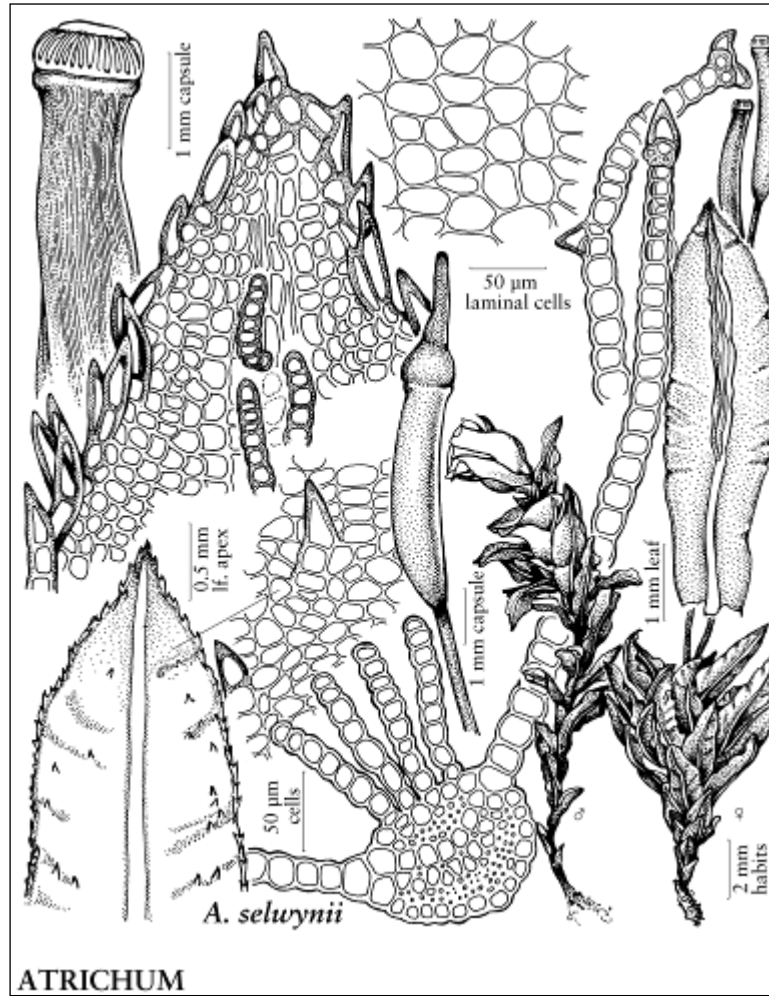
ATRICHUM P. Beauv., Mag. Encycl. 5: 329. 1804, name conserved. (Polytrichaceae)

Atrichum selwynii Aust., Bot. Gaz. 2: 95. 1877.

Atrichum rosulatum Müll. Hal.

Wyoming (FNA Vol. 27, 2007). In all states and provinces of the P.N.; Alaska, California, Saskatchewan, Manitoba, Utah, Colorado (Lawton 1971). Teton Co. (Spence 1985).

Teton Co.: 7000', *Hermann 25548* (RM, US-two specimens).



Courtesy FNA Association, FNA 27, 2007

Atrichum undulatum (Hedw.) P.-Beauv., Prodr. Aethéogam., 42. 1805.
Polytrichum undulatum Hedw., Sp. Musc. Frond., 98. 1801.

Not reported for Wyoming in FNA: “No species occurring in North America has been as widely misunderstood as *A. undulatum*. Evidently introduced from Europe, its weed habitat and strongly arcuate, almost horizontal capsules are the surest means of recognition” (Merrill in FNA Vol. 27, 2007).

Teton Co.: Spence (1985).

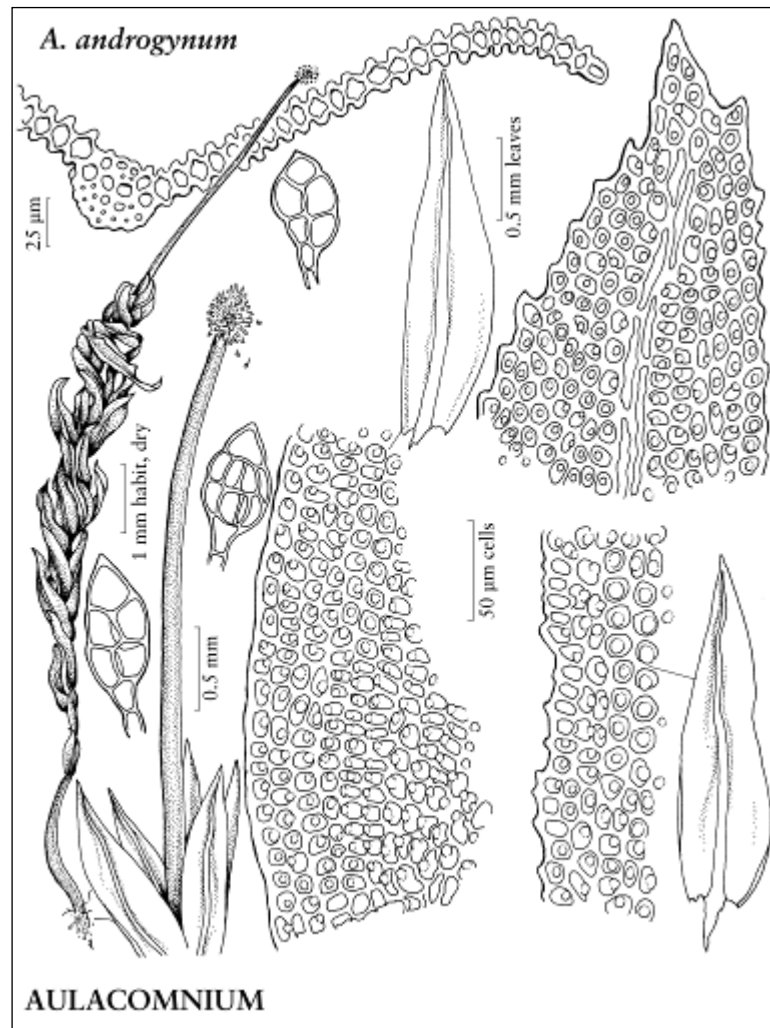
AULACOMNIUM Schwägr., Sp. Musc. Frond. Suppl. 3(1,1, Aulacomnion): 1, plates 215, 216. 1827, name and orthography conserved (as Aulacomnion). (Aulacomniaceae)

Aulacomnium androgynum (Hedw.) Schwägr., Sp. Musc. Frond. Suppl. 3(1,1,Aulacomnion): 2. 1827 (as Aulacomnion).
Bryum androgynum Hedw., Sp. Musc. Frond., 178. 1801.

Wyoming (FNA Vol. 28, 2014), Albany Co., Sublette Co., Teton Co., and Yellowstone Natl Park, Porter (1935). Teton Co., Spence (1985) citing Porter (1935) for Teton Co. Nelson (1900). Ireland (1982). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Crook Co.: Black Hills: Williams Spring area, 4 mi ENE of Alva; Sect. 36, T55N, R63W. conifer-deciduous woods, moss shaded on moist soil, 22 May 1977, *Churchill 8859* (TENN).

This plant is smaller than *A. palustre*, so naturally the leaves are shorter, they are not twisted and contorted as in the next. The cells at the base are not differentiated into large, hyaline to yellow cells, nor are they brown. The basal cells here are just like the laminal cells. If the propaguliferous stalks (pseudopodia) are present, they are naked of leaves or bracts and the propagula are clustered into a globose head.



Courtesy FNA Association, FNA 28, 2014

Aulacomnium palustre (Hedw.) Schwägr., *Sp. Musc. Frond. Suppl.* 3(1,1, Aulacomnion): 4. 1827 (as Aulacomnion).

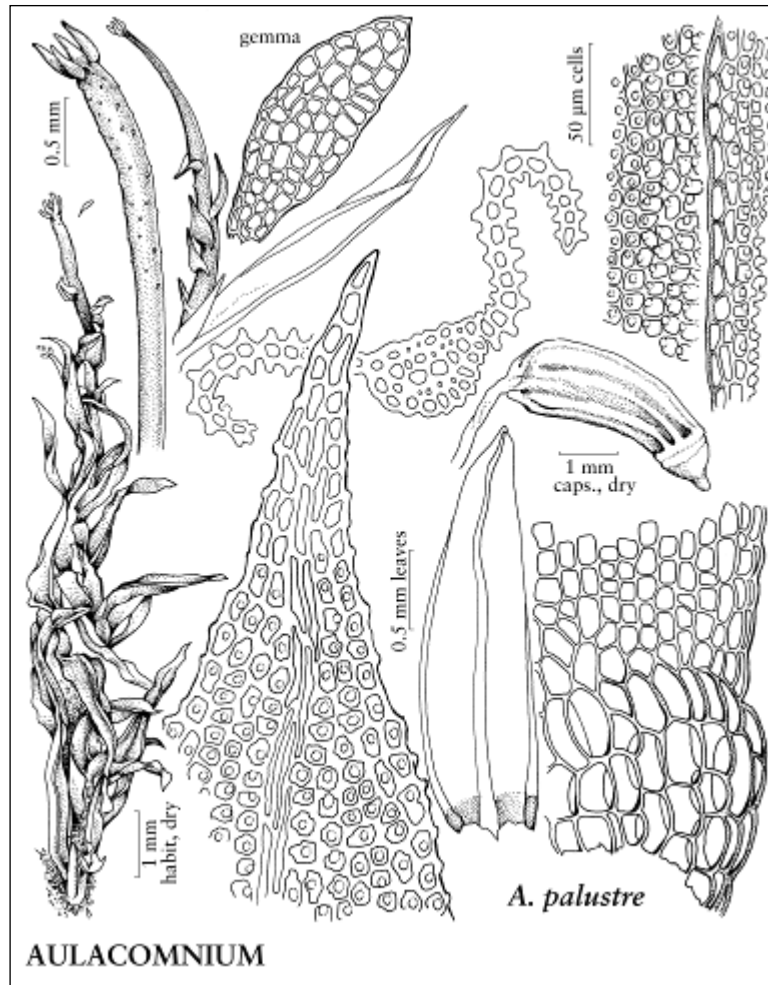
Mnium palustre Hedw., *Sp. Musc. Frond.* 188. 1801.

Gymnocybe palustris (Hedw.) Fries, nom. rejic.

Mnium palustre Hedw.

Mnium papillosum Müll. Hal.
Sphaerocephalus palustris (Hedw.) Lindb.

Wyoming (FNA Vol. 28, 2014). Wyoming: Yellowstone Natl Park, 6000 ped. alt., sterile (1523–25), Roell (1893), “Albany, Sheridan, (Sublette, Teton Cos.), Yellowstone Natl Park, Porter (1935). Park Co.: with *Sphagnum warnstorffii*, *Campylopus schimperi*, Kosovich-Anderson (2011a). Teton Co., Spence (1985). Sublette Co., Cooper & Andrus (1994). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).



Courtesy FNA Association, FNA 27, 2007

Albany Co.: *Nelson 7820* (RM); *Nelson 8899* (RM); Medicine Bow Mts., in woodland bogs, 8–10000 ft, *Nelson 7820* (id'd by Holz. as *A. androgynum*) (TENN). Big Horn Co.: 10,000–10,800 ft, *Odasz 742* (RM); Big Horn Natl. Forest, Lake Solitude Quad., Cloud Peak Wilderness Area, 9,840 ft, filled in lake, Aug 5 1992, *Zacharkevics s.n.*, with *Drepanocladus aduncus aduncus*, *Warnstorffia exannulata* (BING). Carbon Co.: *Hermann 17804* (RM). Fremont Co.: 9300 ft, *Hermann 25293* (RM). Park Co.: 7500 ft, *Hermann 20060* (RM); Beartooth Pass, 10,000 ft, *Hermann 20073* (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 1741* (BUF). Sheridan Co.: Dome Lake, *Nelson 2417* (RM); *Odasz 875* (BUF, RM). Sublette Co.: Bridger Wilderness, Wind River Range, ca. 1.5 mi E of Barnes Lake, 10,080 ft, 42°58'W, 109°34'W, sedge fen with *Bryum pseudotriquetrum*, *Philonotis*

fontana & *Drepanocladus exannulatus*, 17 May 1989, *Andrus 7871* (BING). Teton Co.: on US26 & US237, 1.3 mi W of Togwotee Pass, Bridger-Teton Natl. Forest, ca. 9000', *Picea-Pinus flexilis* woodland, xeric but for stream bottoms, *Lupinulus*, Asters, wooded stream, soggy debris, 6 Jul 1985, *Eckel 94082100*, c.fr., (BUF, RM). Yellowstone Natl Park: *Nelson & Nelson 6429* (RM), *6099* (RM). La Plata Mines, *Nelson 5265* (RM).

When the propagula are gone, frequently the far distal end of the pseudopodium has tiny dark-brown points where the propagula were once attached and the "receptacle" is elongate. The "receptacle" of *A. androgynum*, when the propagulae are gone, is sharply and distinctly spherical. If they extend down a ways from the pseudopodium, this should indicate one is dealing with *A. palustre*, since its propagula are not confined to the tips. Examination of the leaf basal cells should confirm this; note that if large cells are not there, they were probably left on the stem when the leaf was removed.

Aulacomnium papillosum L. & J. Centennial, Albany County (*Nelson 1746*), Porter (1935) = *A. palustre* var. *papillosum* (Müll. Hal.) Podp. No reference to this variety is made in the Anderson et al. (1990) checklist. And no reference is made to this variety by Crum & Anderson (1981: 619).

BARBULA Hedw., Sp. Musc. Frond., 115. 1801, name conserved. (Pottiaceae)

Barbula convoluta Hedw., Sp. Musc. Frond., 120. 1801.

Var. **convoluta**

Barbula closteri Aust.

Barbula convoluta var. *obtusata* Müll. Hal. & Kindb.

Not reported for Wyoming in FNA (FNA Vol. 27, 2007).

Albany Co.: *Hermann 17775 1\2*, 8500 ft, (RM).

Barbula unguiculata Hedw., Sp. Musc. Frond., 118. 1801.

Barbula unguiculata var. *apiculata* (Hedw.) Bruch, Schimper & Gümberl.

Wyoming (FNA Vol. 27, 2007). Rochelle Hills, Campbell Co., Medina (1994).

Albany Co.: along Roger Canyon in the Laramie Mtns, 7 mi, due NE of Laramie city center, *Artemisia* scrub vegetation, limestone cliffs and outcrops, 7,600 ft, soil below edge of limestone boulder, 7 Jun 1993, *Reese 18149* (BUF, LAF).

A specimen from Rochelle Hills, Campbell Co. from MO was redetermined to be *Bryoerythrophyllum recurvirostrum* (q.v.) (5–8 Jun 1975, *Weber s.n.*).

BARTRAMIA Hedw., Sp. Musc. Frond., 164. 1801, name conserved. (Bartramiaceae)

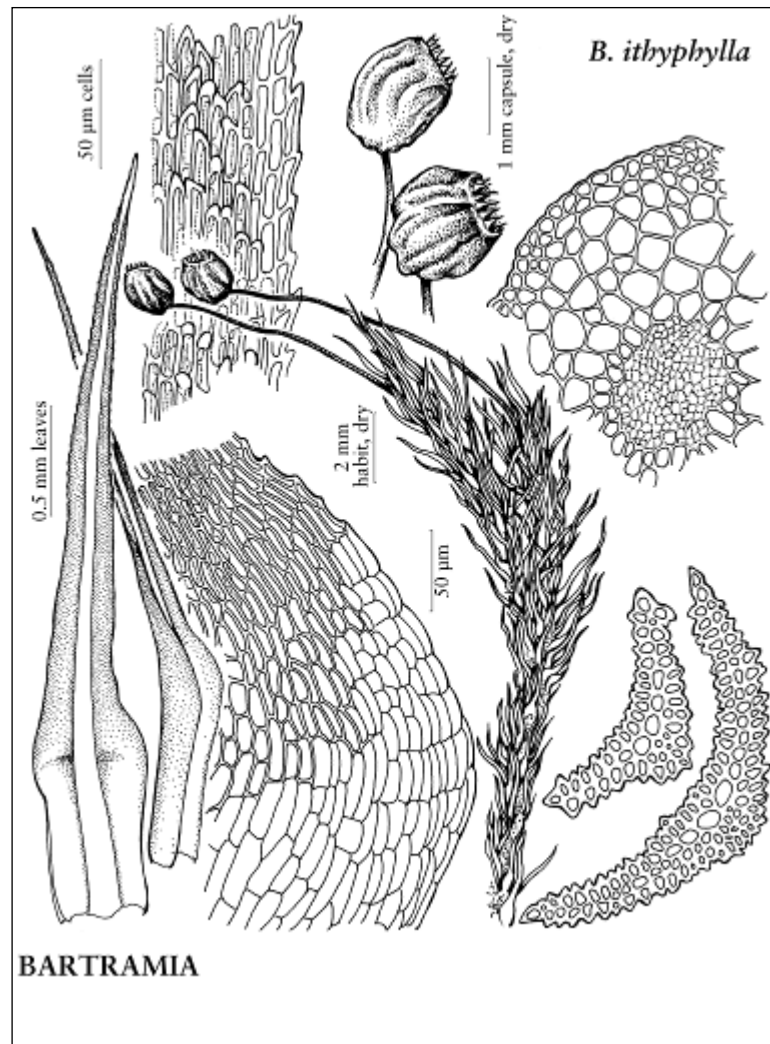
Bartramia ithyphylla Brid., Muscol. Recent. 2(3): 132, plate 1, fig. 6. 1803 (as Barthramia).

Bartramia ithyphylla var. *brevisetata* (Lindb.) Kindb.

Bartramia ithyphylla subsp. *rigidula* (Lindb.) Kindb.

Wyoming (FNA Vol. 28, 2014). Wyoming: Yellowstone Natl Park, c.fr., (1494), Roell (1893). Brooklyn Lake, Albany Co. (*Nelson 5177*), Porter (1937). Teton Co., Spence (1985). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: , 10,800 ft, 3 Aug 1962, *Hermann 17715* (RM). Carbon Co.: 9000', 6 Aug 1962, *Hermann 17800* c.fr. (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 *Mnium thomsonii*, 14 May 1989, *Andrus 7787a* (BING).



Courtesy FNA Association, FNA 27, 2007

BLINDIA P. Bruch & W.P. Schimper, *Bryol. Europ.* 2: 17. 1846. (Seligeriaceae)

Blindia acuta (Hedw.) P. Bruch & W.P. Schimper, *Bryol. Europ.* 2: 19. 1846.
Weissia acuta Hedw., *Sp. Musc. Frond.*, 71. 1801.

Wyoming (FNA Vol. 27, 2007). Park Co., with *Philonotis yezoana*, q.v. Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Brachytheciastrum, as in *Sciuro-hypnum*, is autoicous (synoicous in *B. fendleri*; dioicous in *S. hylotapetum* and *S. latifolium*). The sexual condition of *Brachythecium* is either autoicous or dioicous.

Brachytheciastrum collinum (Schleicher ex Müll. Hal.) Ignatov & Huttunen, *Arctoa* 11: 260. 2003.

Hypnum collinum Schleicher ex Müll. Hal., *Syn. Musc. Frond.* 2: 429. 1851.

Brachythecium collinum (Schleicher ex Müll. Hal.) Schimp.

Brachythecium idahense Ren. & Card.

Hypnum hillebrandii Lesq.

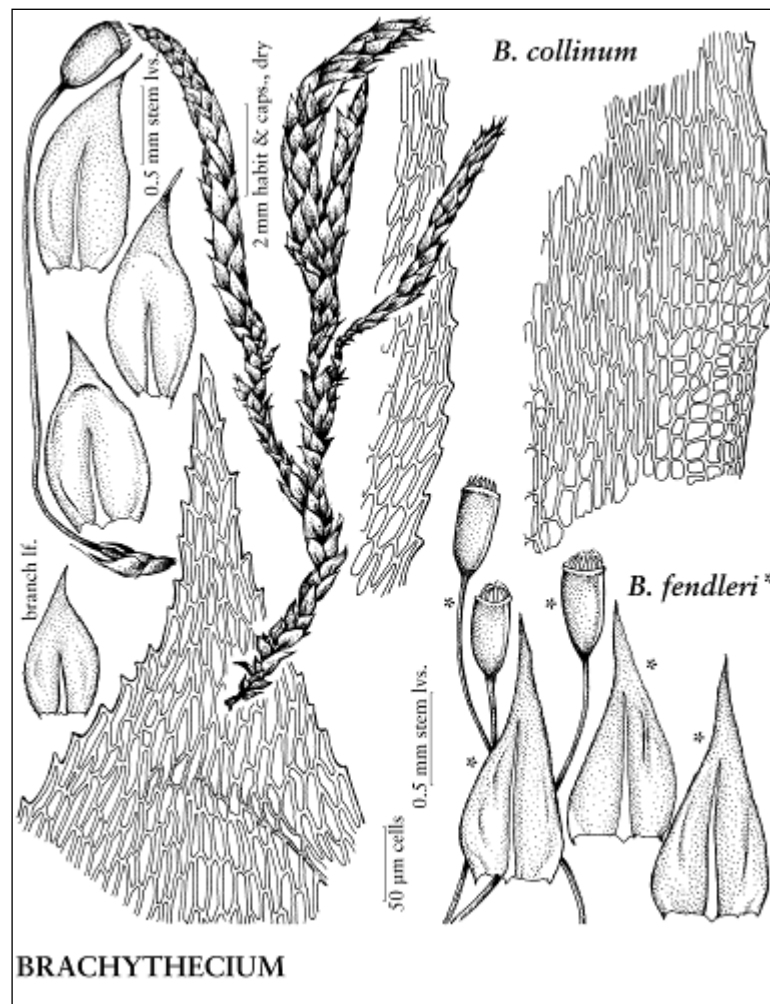
Wyoming (FNA Vol. 28, 2014). (As *Brachythecium collinum*;) Wyoming: Yellowstone Natl Park (1540, 1548a, 1565a), Roell (1893). (As *Brachythecium collinum*;) Albany, Carbon, Sublette, Teton Cos. and Yellowstone Natl Park, Porter (1935). Albany Co. (Porter 680; 698; 651, 654), Yellowstone Natl Park (Bartram and Smiley), Porter (1934). Albany Co, Yellowstone Natl Park, Porter (1937). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

(As *Brachythecium collinum*;) Albany Co.: Laramie Mtns., Roger Canyon, ca. 8 air mi NE of Laramie, 2400 m, limestone outcrops with *Cercocarpus montanus*, Buck 23168 (NY); S bank of Little Brooklyn Lake, Medicine Bow Mtns, 10,300 ft, 30 Jun 1949, Schriever 14 (RM); Medicine Bow Mountains, Barber Lake Picnic area, 2.5 air mi NW of Centennial, along Libby Creek, 8720–8740 ft, *Pinus contorta* forest along stream, on soil, 7 Jun 1993, Miller 10,256 (NYS). Bighorn Co.: on soil along small dry watercourse, moist area in subalpine forest with *Pinus contorta*, *Picea engelmannii*, *Vaccinium scoparium*; near Buckskin Ed Creek; ca. 3.5 air mi WNW of West Tensleep Lake; Bighorn Natl. Forest; with *Pohlia cruda* and *P. nutans*, UTM 13 317827 E 4905084 N, 2749 m, 27 Aug 2005, Lenz 2233a (RM). Carbon Co.: (minute form assoc. with water) Medicine Bow Natl Forest, Sierra Madre Mts., Lost Creek valley, Lost Creek Campground vicinity, roadside of Rd 70, young stands of *Pinus contorta*, on wet loamy and gravelly soil, in partial shade, not abundant, assoc.: *Ceratodon purpureus*, 8550–8600 ft, N 41°08.394', W 107°05.383', T14N R86W S32, 2 Jul 2011, Kosovich-Anderson 9347 (RM). Fremont Co.: Bridger-Teton Natl Forest on US 26 & US 287, between Moran & Dubois, ca. 9000 ft, alpine meadow, much herbage, wet with flowing streams, soil between granite boulders, N slope knoll, 6 Jul 1985, Eckel 94081301, c.fr., (BUF, RM); Fremont Co. near border with Teton Co., between Moran and Dubois twps. on US 26, E of Togwotee pass, ca. 9000 ft at 63.0; S-facing; spruce and 2- & 5-needle pines, herbaceous, not species abundant slope, *Artemisia tridentata* here and there, on granite, with *Dicranoweisia crispula*, 6 Jul 1985, Eckel s.n. (BUF). Johnson Co.: Eckel 14886 (BUF). Park Co.: Bear Tooth Plateau, Cooke City to Red Lodge Hwy; *Picea* forest with *Pinus flexilis* and *P. contorta*, *Vaccinium scoparium*, in duff on forest floor, Weber B-44220 (COLO, RM). Sheridan Co.: on rock in stand of *Picea engelmannii* surrounding large limestone boulder; ca. 0.4 air mi NNE of high point of Sheep Mtn., Bighorn Natl. Forest, UTM 13 273014 E 4981050 N, 2864 m, 31 Aug 2006, Lenz 3447 (RM). Teton Co.: E boundary of Teton Co., Continental Divide, Tworoger Pass, 9000 ft, on ground, 22 Jun 1931, Frye s.n (RM). Yellowstone Natl Park: in Norris Geyser Basin, 14 Aug 1925, Frye s.n., (RM); stream bank on rock, on slope, 17 mi W of East Entrance, 29 Aug 1951, Welch 14883 (YELLO).

Leaves have distinctively sharp serrations from apex to especially the quadrate cells in the basal angles. The leaf cells appear to be short, almost like *Amblystegium*, especially in the apex. Note the leaves are decurrent: care must be taken when removing the leaves. Like *Pseudoleskeella tectorum* (which has none to variable costae in the leaves), although the julaceous form in drier habitats is perhaps more readily come to hand, one must be careful of the shade forms, too. The costa in these is single and strong enough to separate from *P. tectorum* (with has generally entire margins, seldom fruits and has short cells as in *Amblystegium*). *Brachytheciastrum collinum* fruits in July. This species is separated from *B. velutinum* var. *venustum* by the smooth setae (although see Flowers

(1973) who indicates scattered papillae), but more importantly the broadly ovate-lanceolate character of the leaves with their abrupt acumination. Flowers (1973) also indicated that *B. velutinum* var. *venustum* has “perichaetial leaves slenderly-long acuminate, often hairlike,” which *B. collinum* does not have; the variety also has narrower leaves overall. The shade form of *B. collinum* is not particularly concave in leaves on the slide, although they appear this way on the stem.

Brachytheciastrum collinum may be more associated with humus and litter, rotten wood than var. *venustum* which seems to prefer soil and rock. Weber & Wittmann’s (2007) thought that *B. collinum* and *B. velutinum* may be variants of one another seems credible. Note somewhat julaceous habit of *B. fendleri* that may be confused with this species. *Brachytheciastrum fendleri* has distinctive upright fruit, whereas *Brachytheciastrum collinum* has capsules that are horizontal; *B. collinum* is abruptly acuminate, while *B. fendleri* is “gradually to narrowly acuminate, sometimes very slenderly so” Flowers (1973: 430).



Courtesy FNA Association, FNA 28, 2014

Brachytheciastrum fendleri (Sull.) Ochyra & Żarnowiec, Biodivers. Poland 3: 172. 2003.

Leskea fendleri Sull., Mem. Amer. Acad. Arts, n. s. 4:169, plate 1. 1849.

Brachythecium fendleri (Sull.) A. Jaeger

Brachythecium utahense James in Watson

Hypnum fendleri (Sull.) Sull. & Lesq.

Wyoming (FNA Vol. 28, 2014). (As *Brachythecium fendleri*;) (earlier as *Brachythecium utahense* James) Albany Co. (*Porter 1442*; 637); Carbon Co. (*Porter 908*), Yellowstone Natl Park (*Smiley*), Porter (1934). (As *Brachythecium utahense* James) Albany County, Carbon County, and Yellowstone Natl Park, Porter (1935). (As *Brachythecium utahense* James) Albany, Carbon Cos., Yellowstone Natl Park, Porter (1937). Southern Wyoming, Flowers (1973). Teton Co., Spence (1985). Campbell Co., Medina (1994).

(As *Brachythecium fendleri*;) Albany Co.: Centennial Hills, 20 Aug 1896, *Nelson 2716* c.fr. (RM).

(As *Brachythecium fendleri*) This rather diminutive *Brachythecium* is distinctive in its upright straight capsules what are longer and narrower than typical for the genus. Its small size puts it in Flower's (1973) *B. collinum* group (*fendleri*, *delicatumum*, *suberythrorrhizon* (= *velutinum* var. *venustum*), *erythrorrhizon*). It is also distinctive in its synoicous inflorescences. Without fruit they look remarkably like *B. collinum*. *Brachythecium fendleri* is sharply toothed, even to the base and in an Arizona specimen has spoon-shaped leaves especially at the leaf base (*MacFadden 8009* det. Grout from Grand Canyon, at RM). Note that the leaves appear broadly recurved-naviculate on one side at the leaf base.

The 2716 specimen has *coarse*, sharp serrate teeth to the leaf base, with shortened cells in the apex and occasionally rostrate opercula, but what else could be synoicous as this specimen robustly is? And the cilia are short while the endostome matches the exostome teeth. Teeth and short apical cells are distinctive in branch leaves.

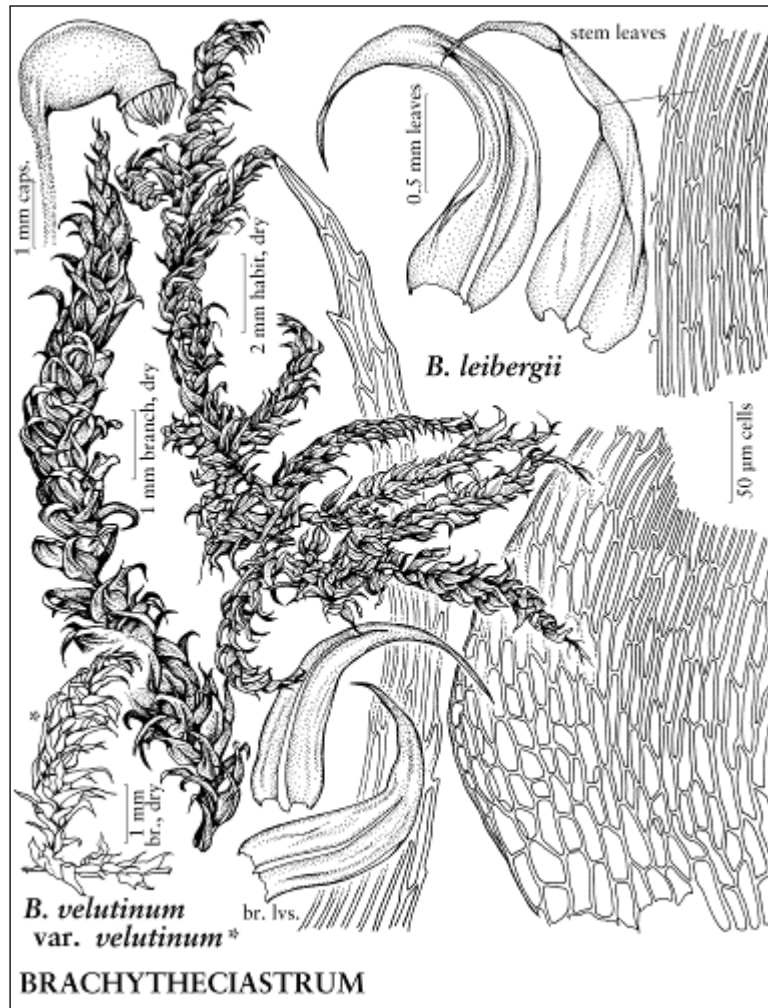
Brachytheciastrum leibergii (Grout) Ignatov & Huttunen, *Arctoa* 11: 260. 2003.

Brachythecium leibergii Grout, *Mem. Torrey Bot. Club* 6: 197. 1897.

Wyoming (FNA Vol. 28, 2014).

(As *Brachythecium leibergii*) Albany Co.: Medicine Bow Mountains, Medicine Bow Natl Forest, Barber Lake Picnic Area, 2.5 air mi NW of Centennial, 2660 m, *Pinus contorta* forest along Libby Creek, 7 Jun 1993, *Buck 23202* (setae detaching, old), with *Ceratodon purpureus*, *Distichium capillaceum* (NY). Carbon Co.: on wet rock at edge of Trail Creek, W of Sand Lake Rd., 9000 ft, Medicine Bow Mts., 4 1/2 SW Morgan, Aug 6 1962, *Hermann 17808*) (sterile, based on pinnate branching, serrations, plications, decurrencies, robust, etc.) det. by Robinson (RM, US). Yellowstone Natl Park: Old Cooke Ranger Station, 31 Aug 1948, *Conard 48-282*) (det. as *B. glareosum*, autoicous) (YELLO); E slope along old road above Crescent Hill, 3 Sep 1948, *Conard 48-253* (det. as *B. glareosum*, autoicous) (YELLO).

This is a beautiful, robust moss with clearly pinnate branching except for multiple branching supporting gametoecia. Leaves are serrate and seta roughened; leaves are falcate, even when removed from the stem, clearly plicate wet or dry. The plant is very robust, compared to other pleurocarps in mixed collections. The shoulders of the leaf are lower than other species of the genus, it seems, and the strong serrations are striking. The papillae are tiny, sharp and distant on the seta. The homomallous character need not be strong — some leaves can be straight. The alar cells are numerous, quadrate, alar areas can be excavate. In both of the Yellowstone specimens (Conard) long lengths of stem material stripped away along with the decurrencies. These specimens were irregularly pinnate and resemble large forms of *B. velutinum* (note coarse serrations like *B. collinum*—a continuous gradation?). Branch leaves are coarsely serrate (not serrulate), reminiscent of the serrations on *B. collinum*.



Courtesy FNA Association, FNA 28, 2014

Brachytheciastrum velutinum (Hedw.) Ignatov & Huttunen, *Arctoa* 11: 260. 2003.
Hypnum velutinum Hedw., *Sp. Musc. Frond.*, 272. 1801.

Var. velutinum

Brachythecium collinum var. *idahense* (Ren.& Card.) Grout
Brachythecium idahense Ren. & Card.
Brachythecium petrophilum R.S. Williams
Hypnum velutinum Hedw.

The var. *velutinum* has not been found in Wyoming according to FNA (Vol. 28, 2014).
 Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

(As *Brachythecium velutinum*) Yellowstone Natl Park (*Smiley*), Porter (1934). Lake and
 Canyon, Yellowstone Natl Park (*Smiley*), Porter (1935); Yellowstone Natl Park, Porter (1937). Teton
 Co., Spence (1985). Ireland (1982).

The typical variety is said to have setae roughened by large papillae throughout, whereas the
 var. *salicinum* (as var. *venustum*) has them smooth or slightly rough at the base (Lawton 1971).

Var. **salicinum** (Schimper) Ochyra & Żarnowiec, Biodivers. Poland 3: 172. 2003.

Brachythecium salicinum Schimper in P. Bruch and W.P. Schimper, Bryol. Europ. 6: 19, pl. 548. 1853.

Brachythecium olympicum Jur. in Ung. & Kotschy

Brachythecium petrophilum Williams

Brachythecium suberythrorrhizon Ren. & Card.

Brachythecium suberythrorrhizon Renault & Card.

Brachythecium suberythrorrhizon var. *suberythrorrhizon* (Ren. & Card.) Grout

Brachythecium velutinum var. *venustum* (De Not.) Archangelico

Chamberlainia collina var. *suberythrorrhiza* (Ren. & Card.) Robins.

Hypnum venustum De Not.

Wyoming (FNA Vol. 28, 2014). (As *Brachythecium suberythrorrhizon* Ren. & Card.)
Wyoming, Flowers (1973).

(As *Brachythecium velutinum* var. *venustum*) Albany Co.: Medicine Bow Mtns., Barber Lake picnic area, ca. 2.5 mi due NW of Centennial; ca. 8,700 ft, *Pinus contorta* forest along Libby Creek, 7 Jun 1993, Reese 18169 (LAF); Laramie Mountains, Roger Canyon, 8 air mi NE of Laramie city center, 7850–8000 ft, on soil under shrubs, 7 Jun 1993, Miller 10,243 (NYS). Fremont Co. near border with Teton Co., between Moran and Dubois twps., on US 26, E of Togwotee pass, ca. 9,000 ft, at 63.0 mi; S-facing; spruce and 2 & 5-needle pines; herbaceous, not species abundant slope; *Artemisia tridentata* here and there; on granite; with *Dicranoweisia crispula*, 6 Jul 1985, Eckel s.n.. (BUF). Lincoln Co.: on granite boulder on slope above Salt River, Silver Stream Motel, 6000 ft, 11 mi N of Ashton, 11 Aug 1962, Hermann 17843 (verified by Robinson as *Chamberlainia collina* var. *suberythrorrhiza*—seems to intergrade between *B. venustum* and *B. collinum* as noted by Weber and so noted by others) (RM). Teton Co.: on US26 & US237, 1.3 mi W of Togwotee Pass, Bridger-Teton Natl. Forest, ca. 9000', *Picea-Pinus flexilis* wood-land, xeric but for stream bottoms. *Lupinus*, Asters, soil, forest floor, over organic debris, including punky wood, 6 Jul 1985, Eckel 94081608, c.fr. (RM, BUF).

Another specimen (Eckel 94082003, BUF) from the same locality shows a nearly complete intergradation with *Brachythecium collinum*. In the Teton specimen, many of the stems are light yellow green. Note the leaf cells are so thick walled and short that they appear to be those of an *Amblystegium*, were it not for the capsules. The serrations are as distinctive as in those of *B. collinum*, which may be a variant of this species (Weber 1973), much as *Brachythecium turgidum* seems to be a variant of *Br. salebrosum*.

In Lawton's (1971) key, she reflects the variability of the species in the degree of its plications (distinct to smooth) and the variability of the falcations (curved to straight)—the autoicous condition of this species is readily evident and critical to a quick determination of this plant. It is likely that Flower's (1973) *Brachythecium delicatulum*, *B. collinum* var. *idahense*, *B. collinum*, *B. velutinum* and *B. velutinum* var. *venustum* are all the same thing. The Reese specimen from Albany Co. was large and looked like *B. albicans* with its long, narrow acumina, but it was so falcate as to appear to be a *Drepanocladus*; it was autoicous, seta smooth and cells on margins serrulate, serrate in branch leaves, strongly plicate. Specimens of var. *salicinum* examined had smooth setae near the capsule and throughout and most of the leaves were straight (some somewhat curved). Specimens examined were strongly serrulate to the base. In many manuals *Brachythecium velutinum* is described as having a seta papillose throughout—this character would correspond to *Brachytheciastrum velutinum* var. *velutinum*, not yet noted for Wyoming.

BRACHYTHECIUM Schimper in P. Bruch and W.P. Schimper, *Bryol. Europ.* 6: 5, plates 535–555. 1853. (Brachytheciaceae)

When taking leaves off a stem in *Brachythecium*, care must be made to preserve or note decurrencies (in many spp.: *B. frigidum*, *B. albicans*, *B. rutabulum*, *B. reflexum*, etc.). Alar cells are best seen in older leaves. Sometimes *B. salebrosum* can be so plicate it seems like a *Homalothecium*, that genus however is entirely dioicous. Quasi-deltoid, flat leaves with absolutely entire margins and inflated basal cells of plants from wet areas, such as the edges of lakes or in marshes may lead one to try *B. nelsonii* or *B. starkei* but one might also want to consider *Drepanocladus aduncus* var. *kneiffii*—this has straight leaves and may have them short—perhaps what one may not expect from a *Drepanocladus* (i.e., long, falcate leaves). The clue is the leaf cells which are short enough to remind one of the *Amblystegiaceae* and the completely entire leaf margins: of the two *Brachythecia* mentioned, the first has concave bases, the last is toothed and both have longer cells.

The sexual condition of *Brachythecium* is either autoicous or dioicous. That of *Sciurohypnum* is, as in *Brachytheciastrum*, autoicous (dioicous in *S. hylotapetum* and *S. latifolium*), although synoicous in *Brachytheciastrum fendleri*.

Note that the falcate types are:

B. leibergii (rough seta, autoicous, regularly pinnate, *smooth to serrulate*, esp. in branch leaves); large 1.8–2.6 mm. *Plicate*. The pinnate character is probably decisive; Lawton (1971: 293) says “The branching is usually more regularly pinnate than in any of the species which might be confused with it.”

B. erythrorrhizon (smooth seta, irregular branching, dioicous, leaves 1.5–2 mm, branch leaves without spines at costa end). *Plicate*. Leaf margins *entire*. “Dioicous inflorescences and smooth setae, and the broad leaves are plicate and falcate with serrations at the tips” (Crum & Anderson 1981: 1032).

B. velutinum (smooth seta, irregular branching, autoicous, small: 1–1.8 mm leaves, costa with spines at tips, leaf margins). *Serrulate* (perhaps as in *B. collinum*, cf. Weber 1973), *not or slightly plicate*.

Brachythecium acutum (Mitt.) Sull., *Icon. Musc.*, suppl., 99. 1874.

Hypnum acutum Mitt., *J. Linn. Soc., Bot.* 8: 33, plate 6 (upper right). 1864.

Amblystegium riparium var. *serratum* Ren. & Card.

Brachythecium pseudocollinum Kindb.

Wyoming (FNA Vol. 28, 2014). Albany Co. (*Porter* 559; 747; 753; 783); Teton Co. (*Porter* 1159 & 1163), *Porter* (1934). (As *Brachythecium acutum*) Albany County, Carbon County and Teton County, *Porter* (1935). Albany, Carbon, Teton cos. Yellowstone Natl Park, *Porter* (1935). Teton Co., Spence (1985). Albany Co. (*Porter* 536, 542); Carbon Co. (*Porter* 900); Teton Co. (*Porter* 1205, 1216; 1185a); Yellowstone Natl Park (*Nelson* 5812; *Porter* 1242, 1244), *Porter* (1934). Reported for Albany and Teton Cos. by *Porter* (1937), Crum and Anderson (1981: 1055) exclude it from the Eastern North American flora. Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: Centennial Valley, 17 Aug 1895, *Nelson* 1698, c.fr. (RM).

Excluded from northeastern North America by Crum and Anderson (1981). “Grout recognized this species from a broad range across the continent, in the northern United States and

adjacent Canada, south in our area to New Jersey and Ohio. Robinson considered it to be merely an eplicate form of *Brachythecium salebrosum*,” p. 1055. The Nelson specimen keyed to *Br. salebrosum* in Lawton (1971), not *B. albicans*, which is dioicous.

Brachythecium albicans (Hedw.) Schimp. in P. Bruch and W.P. Schimper, Bryol. Europ. 6: 23. 1853.

Hypnum albicans Hedw., Sp. Musc. Frond., 251. 1801.

Brachythecium albicans var. *occidentale* Ren. & Card.

Brachythecium beringianum Card. & Thériot

Brachythecium pseudoalbicans Kindb.

Brachythecium pseudoalbicans Kindb. in Macoun

Chamberlainia albicans (Hedw.) H. Robinson

Wyoming (FNA Vol. 28, 2014). Wyoming: Yellowstone Natl Park (1542–45), Roell (1893). Mammoth, Old Faithful, and Lake, Yellowstone Natl Park (*Smiley*), Porter (1935). Teton Co., Spence (1985).

Lincoln Co.: moist open willow flat along Fire Trail Creek at Greys River, 6400 ft, Salt River Range, 8 mi E of Alpine Junction, 30 Aug 1973, *Hermann* 25588); specimen with no teeth except some at tip—including branch leaves: strongly falcate, branches not all julaceous when dry (RM); base of a dead tree in open shade, Fishing Bridge, 10 Sep 1932 *Smiley* 257 (det. as *B. glareosum*-dioicous).

Separated from *B. erythrorhizon* (which is falcate) by the entire margins of branch leaves. The leaf apices are strikingly long-filiform in Crum & Anderson Exsiccata 783, although only slenderly acuminate (Crum & Anderson 1981: 1025). Stem leaves are strongly plicate and have long rather broad decurrencies, concave at the base. The stems are terete to julaceous—imbricate when dry. In the exsiccata specimen the lax quadrate cells are collapsed under Hoyer's solution. Flowers (1973) and Lawton (1971) make the point that the leaves are *entire*. “Sometimes slightly serrate at the apex only” according to Crum and Anderson (1981). The branches appear to be *small*. Specimens of *B. salebrosum* may occasionally have long acuminations, so untypical, one would think, that *B. albicans* may come to mind. *Brachythecium salebrosum* will be autoicous and the plants will be plumose, that is, foliose rather than julaceous or ropey as in *B. albicans*. Very important are the serrations all up and down the stem leaves of *B. salebrosum*, more pronounced on branch leaves: these are absent in *B. albicans*.

Brachythecium asperrimum (Mitt.) Sull. = *Brachythecium frigidum* (Müll. Hal.) Besch.

Brachythecium brandegeei (Austin) H. Robinson, Bryologist 65: 125. 1963 (as brandegei).

Hypnum brandegeei Aust., Bot. Gaz. 3: 31. 1878 (as brandegei).

Cirriphyllum brandegeei (Austin) Grout

Wyoming; “Wet soil in mountain tundra, rock, wet cliffs; high elevations (3100–3900 m); Colo., Wyo.” (Ignatov, FNA Vol. 28, 2014), Kosovich-Anderson & Ignatov (2010). Park Co.: *Brachythecium brandegeei* was reported growing with *Polytrichastrum sexangulare*, *Polytrichum juniperinum*, and *Sanionia nivalis*, Kosovich-Anderson & Weber (2011). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

An extremely rare species in North America, which is difficult to separate from *B. udum* (see below). *Brachythecium brandegeei* is mostly restricted to Colorado, with an additional station from Wyoming. According to Ignatov (2014), *Brachythecium brandegeei* is reported and described in

North America only by a personal communication by W. A. Weber for Colorado in Clear Creek, Park and Summit counties, and a collection by Kosovich-Anderson in Wyoming, Kosovich-Anderson & Ignatov (2010) according to Ignatov (2014). The species was not reported for Colorado by Weber and Wittmann (2007), although apparently all the material in North America since the species was described derived from that state (see discussion below).

Brachythecium udum, which is found in northern Europe, can with difficulty be separated morphologically from *B. brandegeei*, as the two species are distinct mostly as the result of a phylogenetic sequence analysis. Both species “have ovate leaves abruptly contracted to the acumen, broad laminal cells, subentire leaf margins, and both are apparently dioicous (male plants and sporophytes unknown).” The following characters may be used to separate them (Ignatov 2014):

B. brandegeei: plants intense green, small to medium sized; leaves not plicate; laminal cells often broad in distal leaf; alar cells quadrate, slightly wider than laminal cells, thin-walled, in a rather inconspicuous group.

B. udum: plants light or pale green or straw-colored, medium-sized to large; leaves plicate; laminal cells narrow distally, broad proximally; alar cells variable: similar in width to laminal cells to (often) conspicuously enlarged and forming a pellucid area in the leaf corners.

Harold Robinson (1962) noted that “as far as I am aware, (*B. brandegeei*) is represented only by the series of sterile original specimens at the New York Botanical Garden, collected in Colorado” and suggested *B. brandegeei* “could be a rather aquatic form of *B. cirrosum*.” It is not distinct from *B. cirrosum* except for its “lax appearance but does not differ greatly in essential details. The limited material does not permit any definite conclusions.” *Brachythecium brandegeei* in Robinson’s key to the genus notes the “alar cells never inflated, often poorly differentiated; leaves complanate-foliate (not strongly concave), leaf apex usually abruptly acuminate (not acute), leaf areolation very lax, cells 6–8 um wide; leaves not strongly concave; acumen very short.”

Brachythecium calcareum Kindb. = *Brachythecium campestre* (Müll. Hal.) Schimp. in P. Bruch and W.P. Schimper

[*Brachythecium campestre* (Müll. Hal.) Schimp. in P. Bruch and W.P. Schimper, Bryol. Europ. 6: 16. 1853, excluded]

Hypnum rutabulum var. *campestre* Müll. Hal., Syn. Musc. Frond. 2: 368. 1851.

Brachythecium calcareum Kindb.

Brachythecium leucoglaucum Müll. Hal. & Kindb.

Not reported for Wyoming in FNA; according to Ignatov, the distribution of the species is eastern North America (FNA Vol. 28, 2014). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

(As *Brachythecium calcareum*) (A specimen of Dwight C. Smiley's at YELLO (no. 27) determined as *B. flexicaule*, “moist stream bank, mouth of Clematis Gulch” is a sterile, depauperate *Brachythecium*. A row of inflated basal cells attaching leaves to the stem seen on old leaves indicates this specimen is *Brachythecium frigidum*.)

Brachythecium cirrosum (Schwägr.) Schimp., Syn. Musc. Eur., 696. 1860 (as *cirrosum*).

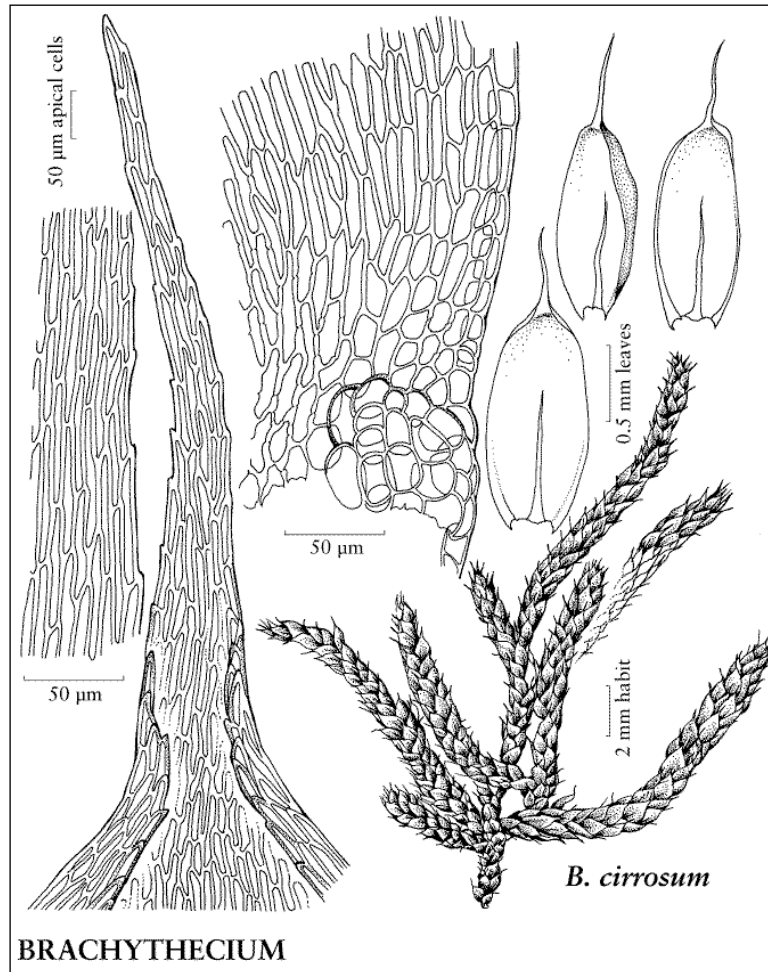
Hypnum cirrosum Schwägr. in J.A. Schultes, Reise Glockner 2: 365. 1804.

Cirriphyllum cirrosum (Schwägr.) Grout

Wyoming (FNA Vol. 28, 2014).

(As *Cirriphyllum cirrosum*) Albany Co.: Medicine Bow Mts., Medicine Bow Natl Forest, Barber Lake Picnic Area, 2.5 air mi NW of Centennial, *Pinus contorta* forest along Libby Creek, 2660 m, *Buck* 23189 (in specimen labeled *Amblystegium serpens*, with *Campylium hispidulum*, associated with rotten wood) (NY).

The margins are quite serrate, there are long decurrencies down the stem.



Courtesy FNA Association, FNA 28, 2014

Brachythecium collinum (Schleich. ex Müll. Hal.) Schimp. in B.S.G. = *Brachytheciastrum collinum* (Schleicher ex Müll. Hal.) Ignatov & Huttunen

Brachythecium leibergii Grout = *Brachytheciastrum leibergii* (Grout) Ignatov & Huttunen

Brachythecium erythrorrhizon Schimper in P. Bruch and W.P. Schimper, *Bryol. Europ.* 6: 18, plate 547. 1853.

Var. ***erythrorrhizon*** or s.l.

Wyoming (FNA, Vol. 28, 2014). Albany, Carbon, Teton counties and Yellowstone Natl Park, Porter (1935). (?Albany (*Porter* 859); Carbon (*Porter* 895); Teton (*Porter* 1217, 1222; *Porter* 1158, 1190); Yellowstone Natl Park (*Smiley*), Porter 1934. Albany, Carbon, Teton Cos., Yellowstone

Natl Park, Porter (1937). Teton Co., Spence (1985), Ireland (1982). Sublette Co., Cooper & Andrus (1994). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co. “Growing along rotten log on moist soil, common,” *Lichvar 1347a* (RM); carpeting floor of spruce forest, Little Brooklyn lake, 10,400 ft, Medicine Bow Mtns, 7 mi NW of Centennial, *Hermann 26721a*. (sterile, but leaves gently falcate in places on stem, plicate, entire margins, plicate, etc., rhizoids sparse (RM); Medicine Bow Mountains, Barber Lake Picnic Area, 2.5 air mi NW of Centennial, along Libby Creek, 8720–8740 ft, *Pinus contorta* forest; on soil under *Pinus contorta*, 7 Jun 1993, *Miller 10,257* (NYS). Park Co.: Beartooth Plateau, Cooke City to Red Lodge Hwy, *Picea* forest with *Pinus flexilis* and *P. contorta*, *Vaccinium scoparium*, on forest floor, *Weber B-44219*, falcation strong, on wood (COLO, RM). Sublette Co.: Bridger Wilderness, Wind River Range 17 May 1989 ca. 1.5 mi E of Barnes Lake, 10,080 ft, 42°58' N, 109°34' W, thin peat terrace, *Andrus 7870* (BING). Teton Co.: Cascade Canyon, 14 Aug 1953, *Conard s.n* (US).

“Plants medium-sized to moderately large. Leaves falcate-secund, 1.5–2.3 mm; laminal cells linear, 60–90 μm ” (Ignatov, FNA Vol. 28, 2014). This plant is said to have lots of rhizoids (abundant) at the base of the stem, but not seen in the last of the two specimens cited above or in any of the specimens seen. This species is yellow-green to pale yellow; green to sordid looking when the leaves assume a reddish cast, and then the red rhizoids evident. Sometimes the falcateness is only evident on some of the stems and stem Sect.s. The sterile Park Co. specimen is differentiated from *B. leibergii* by its irregular branching.

The leaves are unusually broad and falcate and deeply plicate, leaving one, macroscopically at least, to jump at it being *Drepanocladus uncinatus*. The costa appears very broad, hinting at *Cratoneuron*, but basal cells are not sharply inflated as in that genus (and *Palustriella*). The leaf cells appear short for a *Brachythecium*, hence an appearance of something in the Amblystegiaceae. The falcation and plication are striking under the dissecting scope. Note that *B. leibergii* is generally serrate along the leaf margins, or at the base (occasionally smooth according to Lawton (1971)). *Brachythecium erythrorrhizon* is more smooth, denticulate in the apex.

Var. **alpinum** Kosovich-Anderson & Ignatov, *Arctoa* 19: 190, fig. 4. 2011.

Wyoming, “Variety *alpinum* has strongly plicate and concave leaves, julaceous foliage, and numerous alar cells. These alpine plants from the Rocky Mountains resemble *Brachythecium coruscum* rather than *B. erythrorrhizon* var. *erythrorrhizon*, but differ in larger cells in alar regions and leaf decurrencies, Kosovich-Anderson and Ignatov (2010); Ignatov (FNA Vol. 28, 2014).

Brachythecium fendleri (Sull.) A. Jaeg. = *Brachytheciastrum fendleri* (Sull.) Ochyra & Żarnowiec

Brachythecium flexicaule Ren. & Card. = *Brachythecium salebrosum* (Hoffmann ex F. Weber & D. Mohr) Schimp. in P. Bruch and W.P. Schimper

Brachythecium frigidum (Müll. Hal.) Besch., *Mém. Soc. Natl. Sci. Nat. Cherbourg* 16: 248. 1872

Hypnum frigidum Müll. Hal., *Bot. Zeitung* (Berlin) 14: 456. 1856

Brachythecium asperrimum (Müll. Hal.) Sull.

Brachythecium lamprochryseum Müll. Hal. & Kindb. in Macoun

Brachythecium lamprochryseum var. *giganteum* Grout

Wyoming (FNA Vol. 28, 2014). (As *Brachythecium lamprochryseum* var. *sofaterense* Grout) Solfatara Creek, Yellowstone Natl Park (*Streeter*), “This is the type collections referred to by

Dr. Grout (1928),” Porter (1935). (As *Brachythecium lamprochryseum* Müll. Hal. & Kindb. in Macoun) Wyoming, Flowers (1973).

Albany Co.: Wood’s Creek, Nelson 3480 (US); gregarious over moist bank, canyon bottom in pine forest, 8000 ft, Snowy Range, 31 Jul 1926, *Kelley 791* (NY); ca. 4 air mi E-SE of Centennial, NW base of Sheep Mountain along WY 11, 7700-7900 ft, *Populus*, *Betula* and *Salix* associated with spring seep, open fen, 7 Jun 1993, *Miller 10*, 278 (NYS). Fremont Co.: peaty bank of stream on spruce-fir slope, Burroughs Creek Rd., 8400 ft, Absaroka Range, 14 mi N of Dubois, 28 Aug 1973, *Hermann 25511*, (NY, US); on branch submerged in stream on spruce-fir slope, Burroughs Creek Rd., 8400 ft, Absaroka Range, 14 mi N of Dubois, *Hermann 25520* (US); about 12 mi westward near Togwotee Pass, 9000 ft, on ground, 22 Jun 1931, *Frye s.n.* (RM). Sublette Co.: Bridger Wilderness, Wind River Range, *Carex* fen S of Timico Lake, 18 May 1989, *Andrus 7891* (BING). Teton Co.: partially submerged in shallow stream along Hidden Falls Trail, NW of Jenny Lake, 7000 ft, Teton Range, Grand Teton Natl Park, *Hermann 25578* (US, RM). Yellowstone Natl Park: grassy seep, swale, roots of *Salix*, 6239 ft, a few mi from Mammoth Hot Springs on Road to Tower, with *Aulacomnium palustre*, *Amblystegium juratz.*, *Bryoerythrophyllum recurvirostrum*, *Bryum pseudotriquetrum* var. *bimum*, *Distichium capillaceum*, *Drepanocladus aduncus* & *D. uncinatus*, *Leptobryum pyriforme*, *Plagiomnium rugicum*, *Plagiothecium denticulatum*, 6 Jul 1995, *Eckel 95082825* (BUF).

According to Flowers (1973) the leaves of both this and *Brachythecium asperrimum* can be “sometimes falcate” ! and so confused with *B. erythrorhizon*. In the Fremont Co. specimen, Frye 22 Jun 1931, the decurrent alar cells were distinctly inflated and enlarged. These inflations extended to the costa. For this species the stem attachment cells as left on the leaf are *shelved* so that you need to raise and lower the lens, a depth of field issue in one ridge that is very distinctive in this moss.

[*Brachythecium glareosum* (Br.) Bruch & Schimper, excluded]

Lake, Yellowstone Natl Park (*Smiley*), Porter (1935). Excluded from North America by Anderson et al. (1990). It is not included in the North American flora by Ignatov (FNA Vol. 28, 2014.)

Brachythecium laetum (Brid.) Schimp. in P. Bruch and W.P. Schimper, *Bryol. Europ.* 6: 24. 1853.
Hypnum laetum Brid., *Bryol. Univ.* 2: 479. 1827.
Brachythecium digastrum Müll. Hal. ex Kindb.

Wyoming (FNA Vol. 28, 2014). Wyoming; “the name *Brachythecium oxycladum* of American authors but not (Brid.) A. Jaeger has been applied to many species, which are *B. laetum*” (Ignatov FNA Vol. 28, 2014). Wyoming: Yellowstone Natl Park (*1545*), Roell (1893).

Brachythecium leibergii Grout = *Brachytheciastrum leibergii* (Grout) Ignatov & Huttunen

Brachythecium nelsonii Grout = *Sciuro-hypnum latifolium* (Kindb.) Ignatov & Huttunen

Brachythecium oedipodium (Mitt.) A. Jaeg. = *Sciuro-hypnum oedipodium* (Mitt.) Ignatov & Huttunen

[*Brachythecium oxycladon* (Brid.) A. Jaeg., excluded from North America.]

Yellowstone Natl Park Mammoth and Canyon (*Smiley*), Porter (1935). Yellowstone Natl Park, Porter (1937). Also Porter (1934).

Brachythecium rivulare Schimper in P. Bruch and W.P. Schimper, Bryol. Europ. 6: 17, plate 546. 1853.

Wyoming (FNA Vol. 28, 2014). Note *B. lamprochryseum* is not noted in the treatment of Brachytheciaceae by Ignatov (FNA Vol. 28, 2014). (As *Brachythecium lamprochryseum* var. *sofatarense* Grout. N. Am. Musci Pleuroc. n. 327. 1912 (in Lawton as 1910)). (As *Brachythecium lamprochryseum* var. *sofatarense*), Yellowstone Natl Park (*Mrs. Streeter*, type collection), Porter (1934). Wyoming: Yellowstone Natl Park (1546), Roell (1893). Albany Co. (*Porter 948, 1018; Nelson 5356; Porter 1030; Porter 662; Nelson 10951; Porter 781b*); Teton Co. (*Porter 1153, 1147, 1148*); Yellowstone Natl Park (*Smiley*), Porter (1934). Albany, Teton Cos., Yellowstone Natl Park, Porter (1935). Teton Co., Spence (1985), citing Porter. Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: Peaty bank of N. Fork of Little Laramie River on Sand Lake Rd., 8500 ft, Medicine Bow Mts, 3 mi W Centennial, 4 Aug 1962, *Herman 17738*, sterile (NY); wet knoll on bank of Libby Creek, Libby Creek Campground, 8500 ft, Medicine Bow Mts., 2 mi W of Centennial, *Hermann 17674* (US); Medicine Bow Mtns, Barber Lake Picnic Area, 2.5 air mi NW of Centennial, 2660 m, *Pinus contorta* forest along Libby Creek, *Buck 23198* (NY); Laramie, 15 Sep 1897, *Nelson 4283*, this specimen complanate, flat, leaves very distant on the stem and attenuated — a water form (RM, US). Crook Co.: Black Hills, ca. 6.5 km NNE of Warrens Peaks, along Beaver Creek, *Pinus ponderosa* on upper slopes and *Betula* along creek, moss partly shaded, wet ground in marsh, along creek, 44°32' N 104°25' W, 21 May 1977, *Churchill 8736* (MO). Fremont Co.: on wet boulder in stream on spruce-fir slope, Burroughs Creek Rd, 8400 ft, Absaroka Range, 14 mi N of Dubois, 28 Aug 1973 *Hermann 25517*, specimen broadly acuminate although flat above and with inflated cells to the costa (RM). Natrona Co.: Hat Six Falls, *Nelson 5037*, this specimen with distant leaves and sharply serrulate stem leaf margins; also det. Weber (RM). Park Co.: wet peaty edge of streamlet through tundra below Beartooth Pass, 10,000 ft, Shoshone Natl. Forest, 38 mi NW of Cody 19 Jul 1965, *Hermann 20075* (RM). Sheridan Co.: floating on water and on logs and branches in slow flowing water, Big Horn Natl Forest, T57N, R89W, Sect. 28, with *Mnium medium*, *McKee 92-049* (BUF, RM). Teton Co.: Hwy 22, Burbank Creek 6 mi SE of Victor, *Pinus-Pseudotsuga* forests, primitive rocks, 2260 m, on wet soil and rocks, 7 Aug 1981, *Duell & Duell 2230* (NY). Teton-Sublette cos.: Gros Ventre Mts., 8500 ft, *Curtis s.n.* (NY). Yellowstone Natl Park: Yellowstone Falls, 7500 ft, Jun-Aug 1897, *Rydberg & Bessey s.n.* (NY).

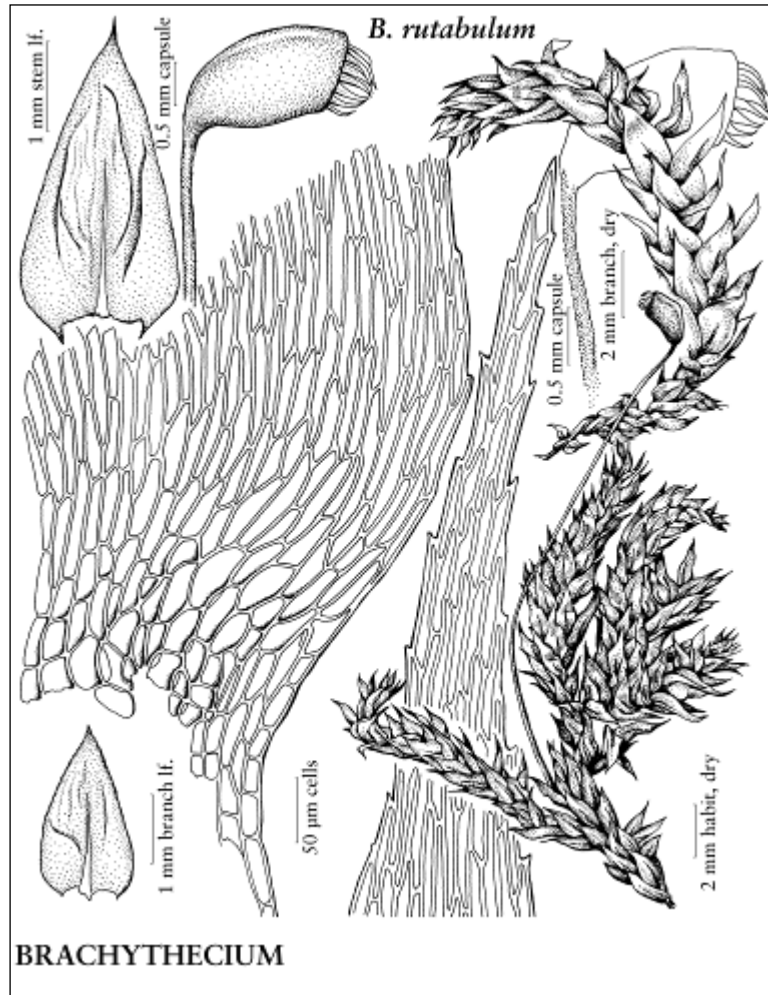
Floating on water and logs and branches in slow moving areas; in swampy areas and moist to soaked humus in forested areas, such as with *Picea glauca*, *Pinus contorta*, *P. ponderosa*, *Pseudotsuga*, in low, wetter areas along creeks and streams with *Salix* and *Betula* extending to from 3260 feet to tundra areas over 10,000 feet. These are robust plants that are pale white-yellow, or whitish green. Broad acute apices are striking for this species in the genus: sharply serrulate above, but some leaves smooth. It has a dendroid habit and leaves *strongly* concave like a spoon; cf. *B. nelsonii*, which is flat, has entire margins typical with extensive inflated basal cells reaching across to costa, and not a dendroid habit. The *Hermann 25517* specimen resembled *B. nelsonii* in inflated cells to the costa and flat upper leaf, but the broadness of the leaf and its abrupt acumination made it *B. rivulare* (that is, the leaf shape was distinctive). Frequently occurring without a dendroid habit, apparently, and with leaves distant on stem—in water (submerged or emergent) forming “long loose masses or when crowded often becoming erect in deep dense tufts.” Not *Scleropodium* because these are not or scarcely decurrent (Lawton 1971: 310).

Brachythecium rutabulum (Hedw.) Schimp. in P. Bruch and W.P. Schimper, Bryol. Europ. 6: 15. 1853.

Hypnum rutabulum Hedw., Sp. Musc. Frond., 276. 1801.

Wyoming; “In eastern North America, *Brachythecium rutabulum* is widespread from the North Temperate Zone to the southern part of the Boreal Zone; in the West it has only been confirmed from British Columbia, Idaho, Montana, and Wyoming. Collections in Colorado were made at 1500–2740 m, otherwise *B. rutabulum* rarely exceeds 1000 m” (Ignatov, FNA Vol. 28, 2014). Big Horn Mts., Big Horn County (*Nelson 2234*), Porter (1935). Big Horn Co. (*Nelson 2234*), Porter (1934). Big Horn Co., Porter (1937).

Albany Co.: NW base of Sheep Mtn., along WY 11, ca. 4 air mi ESE of Centennial, seep area (calcareous fen) with *Populus*, *Betula*, and *Salix*, 7 Jun 1993, *Buck 23247*, capsules missing, most setae detached and lost; note leaves plicate (NY).



Courtesy FNA Association, FNA 28, 2014

Almost identical to *Brachythecium leibergii* in every detail, this species is subpinnate, whereas *B. leibergii* is supposedly more pinnate. *Brachythecium leibergii* has falcate leaves, *B. rutabulum* straight;. *B. rutabulum* stem leaves are abruptly acuminate. Serrations are the same as are sexuality and rough setae. The specimen of *Buck 23247* has strongly plicate stem leaves; these are rather problematical, since this species is not or somewhat plicate. The branch ends also help differentiate the two species: in *B. leibergii* they are densely foliate, *B. rutabulum* they become distant on the stem, narrowed and hence “stoloniferous;” the stem is somewhat visible between leaf bases, as opposed to the dense crowding of the rest of the stem or branch.

Brachythecium rutabulum is said to be somewhat larger than *B. leibergii*. A specimen from Niagara Falls was nearly identical to the Wyoming material: serrate to base, subpinnate, abruptly narrowed acuminate, and *plicate*, concave; another was more oval, very sharply narrowed to a narrow acumen, hair-like and twisted: margins nearly smooth, yet in all other respects the same.

[*Brachythecium salebrosum* (Hoffmann ex F. Weber & D. Mohr) Schimp. in P. Bruch and W.P. Schimper, Bryol. Europ. 6: 20. 1853, excluded]

Hypnum salebrosum Hoffmann ex F. Weber & D. Mohr, Bot. Taschenbuch, 312. 1807.

Brachythecium flexicaule Ren. & Card.

Brachythecium laevisetum Kindb. in Macoun

Not reported for Wyoming by FNA. “*Brachythecium salebrosum* was considered widespread in North America, but a revision of herbarium collections from eastern North America demonstrated mostly *B. acutum*, *B. campestre*, *B. rotaeantum*, and marginal phenotypes of *B. laetum* among these. However, plants of *B. salebrosum* that are identical with European plants occur in western North America and, probably, in eastern Canada” (Ignatov, FNA Vol. 28, 2014). All of the following specimens would need to be reviewed to the species as presented in FNA Vol. 28, 2014); but its presence is to be anticipated. (As *B. flexicaule*) Yellowstone, Porter (1937). (As *B. flexicaule*) Mammoth, Yellowstone Natl Park (*Smiley*), Porter (1935). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Lincoln Co.: on rotted wood on bank of Porcupine Creek on spruce-fir slope, Greys River Valley, 6600 ft, Salt River Range 18 mi SE Alpine Junction, 30 Aug 1973, *Hermann 25595*, capsules gone but setae abundant (US, RM). Park Co.: wet soil in white spruce fen at base of Cathedral Cliff, 2 mi E of Crandall Ranger Station, 6600 ft, 12 Aug 1990, *Elliott 1743* (BUF). 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 9612515* with *Drepanocladus uncinatus*, *Leptodictyum humile*, *Eurhynchiastrum pulchellum*, *Platydictya jungermannioides* (BUF, RM). Teton Co.: on US 26 & US 237, 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, c.fr., c. *Distichium capillacium*, *Aulacomnium palustre*, 6 Jul 1985, *Eckel 94082102* (BUF); dry humus in spruce-fir woods, Hidden Falls Trail NW of Jenny Lake, 7000 ft, 29 Aug 1973, *Hermann 25547* with young sporophyte (RM). Yellowstone Natl Park: on the moist ground in the timber, The Thunderer, 13 Jul 1899, *Nelson & Nelson 5812* (RM, US); Lost Lake outlet, 1 Sep 1948, *Conard 48-225* (det. as *B. glareosum*-autoicous) (YELLOW); Clematis Gulch Trail, 16 Aug 1953, *Lawton 1801* (det. as *B. glareosum*-autoicous) (YELLOW).

This species is robust, has densely foliose, turgid branches, and is much branched, straw colored: yellow/yellow-brown. In the Teton Co. (PME) specimen, the stems were a bright red-burgundy and the fruiting female buds kept popping off. There were no serrations at all on either stem or branch leaves. On the Hermann specimen from Teton, the margins were strongly serrate at the tip, the costa toothed, both margins recurved to apex, the leaf canaliculate. Lawton (1971) and Crum and Anderson (1981) do not describe the leaf this way—but Flowers (1973) does. Flowers may have had a big problem with the genus (note his treatment of *Brachythecium oxycladon*, *digastrum* and *campestre*). Also, a specimen from Sublette Co. had striking, long filiform acuminations, such as *B. albicans* has. Flowers again illustrates an acuminate apex for *B. salebrosum*, otherwise it would be hard to believe the Sublette specimen is indeed that. All leaves, stem and branch, were serrulate, the sex was autoicous and the apex was channeled with revolute borders. There does not seem to be anything else in the key that this specimen could be. Some leaves had decurrencies and excavate enlarged alar cells. Sometimes *B. salebrosum* can be so plicate it seems like a *Homalothecium*, however, that genus is all dioicous.

Brachythecium starkei (Brid.) Schimp. in B.S.G. = *Sciuro-hypnum starkei* (Brid.) Ignatov & Huttunen

Brachythecium turgidum (Hartman) Kindb., Vidensk. Meddel. Naturhist. Foren. Kjøbenhavn, ser. 4, 9: 294. 1888

Hypnum salebrosum var. *turgidum* Hartman, Handb. Skand. Fl. ed. 3, 2: 309. 1838

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

Albany Co.: NW base of Sheep Mtn. along WY 11, ca. 4 air mi ESE of Centennial, seep area (calcareous fen) with *Populus*, *Betula* and *Salix*, Buck 23232 (NY). Park Co.: snowbeds, 3200 m, Weber B-44306, leaves short, dense on stem, to julaceous (COLO, RM, US).

Crum and Anderson (1981) suggest this may be only an ecological expression of *B. salebrosum*. Tufted habit means the branches are short and hence the leaves crowded, making short fat branches of a bright shiny golden to lemon yellow plant with brown along the lower leaves and stems. They stand up at you in tight bristly julaceous branches as you look down on them, wetted up, in the packet, under the dissecting microscope. The Weber specimen shows longer branches, but distinctly julaceous: the bright lemon or straw yellow with brown older parts of *B. salebrosum*. Both have the alar thick-walled pellucid cell groups.

Brachythecium udum I. Hagen, Kongl. Norske Vidensk. Selsk. Skr. (Trondheim) 1908(3): 4, plate 1, fig. 1. 1908.

Brachythecium mildeanum var. *udum* (I. Hagen) Mönk.

B. salebrosum subsp. *udum* (I. Hagen) J.J. Amann

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

Park Co.: Rocky Mountains, Shoshone Natl Forest, Beartooth Plateau, Beartooth Scenic Pass (Hwy 212), 45°01'N 109°25'W, dry course of creek in alpine tundra, not abundant, 10,100 ft, 13 Aug 2008, Kosovich-Anderson 2493, det. Ignatov 2010 (MO); Shoshone Natl Forest, Beartooth Plateau, Beartooth Scenic Pass (Hwy 212), 44°59'N, 109°25'W, vertical wall of pool, on peaty soil, 10,400 ft, 19 Aug 2008, Kosovich-Anderson 3270 det. Ignatov 2010 (MO).

To be looked for on (seasonally) wet soil and soil-covered rocks in Arctic and alpine habitats in northern Canada and at higher elevations (over 3048 m = 10,000 ft.) in the Rocky Mountains. In Alaska the species grows at lower elevations (100 m = 328 ft). This species occurs in Siberia and northern Europe. In FNA Vol. 28, 2014, the only site for this species reported in North America was Alaska, based on W. C. Steere collections from No Luck Lake (Ignatov 2014). Its discovery along Highway 212 in Wyoming in tundra areas indicates it is probably more widespread in North America in higher elevations in the Rocky Mountains, such as Colorado, and northern Canada, but the species is easily confused with other species of *Brachythecium*, such as *B. acutum*, *B. albicans*, *B. boreale* and *B. brandegeei* (Ignatov 2014).

The Colorado endemic (with a Wyoming station) *Brachythecium brandegeei* is most close morphologically with *B. udum*, which is separated by phylogenetic sequence analysis (see discussion of *B. brandegeei*). The sexuality of *B. udum* is apparently dioicous (no male plants or sporophytes are known), and the leaves have enlarged alar cells. Leaves are abruptly acuminate and are nearly entire on the margins.

Brachythecium boreale (leaves acuminate with enlarged alar cells) has regularly serrulate leaf margins with small, sharp, and even teeth and is autoicous, and both species also found only in Alaska. *Brachythecium acutum* has “homogeneous areolation across the leaf base,” the alar cells less differentiated than *B. udum*, which may have strongly enlarged alar cells in wet stations. *Brachythecium udum* also has “poor branching and commonly upright growth” (Ignatov 2014). *Brachythecium acutum* has triangular leaves and toothed margins, *B. udum* has ovate to ovate-lanceolate leaves an an entire margin.

Brachythecium velutinum (Hedw.) Schimp. = *Brachytheciastrum velutinum* (Hedw.) Ignatov & Huttunen var. *velutinum*

Brachythecium velutinum var. *venustum* (De Not.) Arc. = *Brachytheciastrum velutinum* var. *salicinum* (Schimper) Ochyra & Żarnowiec

[*Breutelia mohriana* (Müll. Hal.) Broth., excluded (Brachytheciaceae)]

Carbon Co., Porter (1937). Excluded from N American flora by Anderson et al. (1990). The genus is not reported for North America (Griffin, FNA Vol. 28, 2014.)

[*Brotherella recurvans* (Michaux) M. Fleischer, Nova Guinea 12: 120. 1914, excluded (Sematophyllaceae)]

Leskea recurvans Michaux, Fl. Bor.-Amer. 2: 311. 1803.

Not reported for Wyoming; a species with an eastern distribution (Schofield; FNA Vol. 28, 2014). Lincoln Gulch, Albany County (*Nelson 2628*). “The material is scanty, and Prof. Holz., who identified it, expressed a doubt as to the correctness of the determination,” Porter (1935).

BRYOERYTHROPHYLLUM P.-C. Chen, Hedwigia 80: 4. 1941. (Pottiaceae)

Bryoerythrophyllum recurvirostrum (Hedw.) P.-C. Chen, Hedwigia 80: 5. 1941.

Weissia recurvirostra Hedw., Sp. Musc. Frond., 71. 1801.

Barbula aenea Müll. Hal. & Kindb. in Macoun

Barbula recurvirostra var. *latinervia* Holmen;

Barbula recurvirostris (Hedw.) Dix.

Bryoerythrophyllum recurvirostrum (Hedw.) Chen

Bryoerythrophyllum recurvirostrum var. *dentatum* (Schimper) H.A. Crum, Steere & L.E. Anderson

Bryoerythrophyllum recurvirostrum var. *latinervium* (Holmen) B.M. Murray;

Didymodon canadensis Kindb. in Macoun

Didymodon recurvirostris (Hedw.) Jenn.

Didymodon recurvirostrum var. *dentatus* (Schimper) Steere

Didymodon rubellus B.S.G

Didymodon rubellus var. *dentatus* Schimp.

Didymodon subruber Kindb.

Wyoming (FNA Vol. 27, 2007). In all states and provinces of the Pacific Northwest; widespread in the Middle West and in eastern North America, Greenland and Labrador to North Carolina. (As *Didymodon rubellus* (Hoffm.) B.S.G.) Pole Creek, Albany Co. (*Nelson 3438*), Yellowstone Canyon, Yellowstone Natl Park (*Smiley*), Porter (1937). Teton Co., Spence (1985). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: 10,000 ft, *Hermann 17145*; moist shaded soil at base of calcareous sandstone bluff, Roger Canyon, ca. 8000 ft, 10 mi NE of Laramie, 19 Aug 1961, *Hermann 171512 1/2*, (DUKE, RM). Big Horn Co.: Big Horn Mtns., large rock outcrop, 9200 ft, 9 Jul 1979, *Nelson 3332*, c.fr., old-calyptra, indehisced, (BUF, RM). Campbell Co.: SE Rochelle Hills, head of Wildcat and S. Fork Keyton Creeks, T 41 N, R 69 W, Sect. 11, 12, 1500–1550 m, natural brick and sandstone of Fort Union formation, *Pinus ponderosa-Juniperus-sagebrush* associations, on N slope, Jun 1975, *Weber 5–8* (det. as *Barbula unguiculata*) (COLO). Carbon Co.: 8500 ft, *Hermann 17190* (RM). Fremont Co.: Dubois, big spring about 4 mi E of Dubois, 23 Jun 1931, *Frye s.n.*, c.fr., (WTU); 8400 ft, *Hermann 25513* (RM). Park Co.: Lake Creek at Cody Road, W of Bear Tooth Butte, 24 Aug 1953, *Lawton 2093* (WTU). Sheridan Co.: moist limestone, Big Horn Mountains, T57N, R89W, Sect. 34, 16 Jun 1992, *McKee 92–007*, c.fr., indehisced (BUF, RM). Sublette Co.: 7950 ft, *Hermann 25341* (RM). Teton Co.: 7000 ft, *Hermann 25575* (RM); E of Teton Pass, 15 Aug 1953, *Lawton 1781* (WTU). Weston Co.: dryish hill, on ground, Newcastle, 16 Jul 1942, *Degener & Peiler s.n.*, c.fr., with *Desmatodon obtusifolius* (NY). Yellowstone Natl Park: Yellowstone Lake shoreline, limestone, 23 Jul 1980 *Zander & Eckel s.n.* (BUF); Crescent Hill, 17 Aug 1953, *Lawton 1843* (WTU).

BRYUM Hedw., Sp. Musc. Frond., 178, plate 42, figs. 8–12; plates 43, 44. 1801. (Bryaceae)

I find that there are four species that readily come to hand, all with long awns and appendiculate cilia. The sexuality and habit I have found useful in distinguishing them are these:

Bryum caespiticium (now *Gemmabryum caespiticium*): Stems short: central bulb “on the ground” with side shoots terminated by bulbs (“bulb” = rosulate but in a tear drop figure). Dioicous. Walls may be thin. There are no gametoecea at the tips of side branches (hence, sterile) as there almost always are in *B. pallescens*, the species with which this may be confused. The stems are not elongate, or if they are the rosulate leaf clump is subtended by reduced leaves distant on the stem, not foliose as in *B. pallescens*.

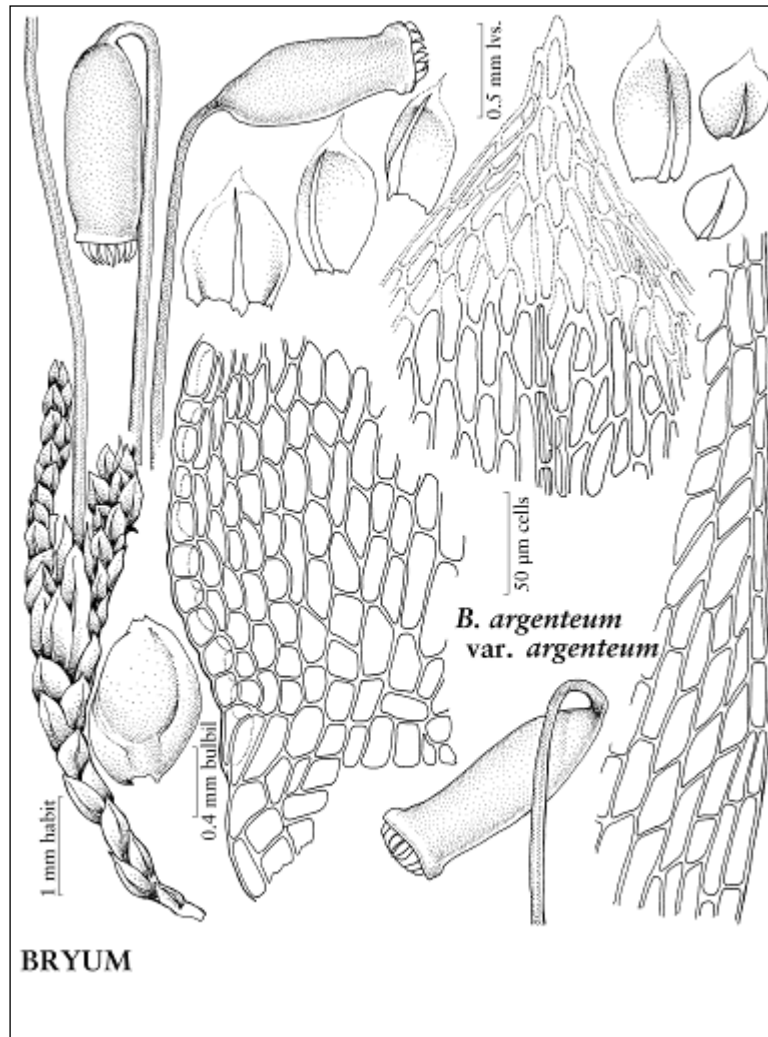
Bryum pallescens: Stems elongate, the leafy area elevated off the ground and leafy with numerous side branches: a “typical” looking plant. Dioicous (male stems). Cladautoicous: with antheridia on branches of fruiting stems, and frequently synoicous, that is, with a few antheridia amid the archegonia. (*B. algovicum* with its unique “gloppy” peristome (adherent endo and exostome, also is branched and *not rosulate*, with similar sexuality).

Bryum lisae var. *cuspidatum*: less diffusely branched, but apparently always synoicous. Rosulate. Note *B. pallescens* is not; *B. caespiticium* is, but is dioicous. *B. caespiticium* resembles bulbs but *B. lisae* seems to flare out like a cup: each stalk is ended in synoici (unlike *pallescens*, which is more often than not male). *Bryum pallescens* has actual branches attached to the stem with male things, and so are autoicous. *Rosulabryum capillare* has thin, lax cell walls, resembling *B. caespiticium*. Note it is only the fruiting stems that have long-awned leaves.

Bryum algovicum Sendtn. ex Müll. Hal. = *Ptychostomum pendulum* Hornschuch

Bryum alpinum Huds. ex With. = *Imbribryum alpinum* (Hudson ex Withering) N. Pedersen

Bryum amblyodon Müll. Hal. = *Ptychostomum inclinatum* (Sw. ex Brid.) J.R. Spence



Courtesy FNA Association, FNA 28, 2014

Bryum argenteum Hedw., Sp. Musc. Frond. 181. 1801.

Var. argenteum

Argyrobryum argenteum (Hedw.) Kindb.

Mnium lanatum P.-Beauv.

Plagiobryum argenteoides Williams

Wyoming (FNA Vol. 28, 2014). Cosmopolitan and common. Laramie, Albany Co. (Nelson 3454); Crow Creek, Albany County (*Porter 1446*), Porter (1935). Campbell Co., Medina (1994). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: Laramie, *E. Nelson 3454* (RM); Laramie Plains, 2 air mi NE of Laramie center, Chugwater redbeds, rim of breaks, 7250–7300 ft, bare prairie soil between herbs, including *Astragalus*, *Eriogonum*, *Penstemon*, with *Tortula caninervis*, 7 Jun 1993, *Miller 10,250* (NYS). Sheridan Co.: Decaying conifer wood, Big Horn Mountains, T57N, R89W, 19 Jun 1992, *McKee 92-F6*, (RM).

Bryum argenteum Hedw. var. *lanatum* (P.-Beauv.) Hampe = *Bryum lanatum* (P.-Beauv.) Brid. (FNA Vol. 28, 2014)

Bryum bimum Schreb. ex Brid. = *Ptychostomum bimum* (Schreber) J.R. Spence

Bryum caespiticium Hedw. = *Gemmabryum caespiticium* (Hedw.) J.R. Spence

Bryum erythroloma (Kindb.) Syed = *Rosulabryum erythroloma* (Kindb.) J.R. Spence, a Pacific Coast species not likely to be found in Wyoming (Spence in FNA Vol. 28, 2014).

Bryum canariense Brid. = *Rosulabryum canariense* (Brid.) Ochyra in R. Ochyra et al.

Bryum capillare Hedw. = *Rosulabryum capillare* (Hedw.) J.R. Spence

Bryum creberrimum Taylor = *Ptychostomum creberrimum* (Taylor) J.R. Spence & H. P. Hamsay (FNA Vol. 28, 2014)

Bryum cyclophyllum (Schwaegr.) P. Bruch & Schimp. in B.S.G. = *Ptychostomum cyclophyllum* (Schwägr.) J.R. Spence

Bryum dichotomum Hedw. = *Gemmabryum dichotomum* (Hedw.) J.R. Spence

Bryum flaccidum Brid. = *Rosulabryum flaccidum* (Brid.) J.R. Spence, q.v.

Bryum gemmiparum DeNot. = *Imbribryum gemmiparum* (DeNot.) J.R. Spence

Bryum lanatum (P.-Beauv.) Brid., Muscol. Recent., suppl. 3: 20. 1817.

Mnium lanatum P.-Beauv., Prodr. Aethéogam., 75. 1805.

Bryum argenteum var. *lanatum* (P.-Beauv.) Hampe

Wyoming (FNA Vol. 28, 2014)

Bryum lisae var. *cuspidatum* (B.S.G.) Marg. = *Ptychostomum creberrimum* (Taylor) J.R. Spence & H.P. Ramsay (FNA Vol. 28, 2014)

[*Bryum occidentale* Sulliv., excluded (Bryaceae)]

The specimen listed as *Bryum occidentale* Sulliv. Bridger Peak, Carbon Co. (Goodding 1966) by Porter (1935) was seen to be *Bryum caespiticium* in both the specimen at RM and US. *Bryum occidentale* does not occur under the Bryaceae (FNA Vol. 28, 2014).

Bryum pallens (Brid.) Sw. in Roel. = *Ptychostomum pallens* (Sw.) J.R. Spence

Bryum pallescens Schleich. ex Schwägr. = *Ptychostomum pallescens* (Schleicher ex Schwägr.) J.R. Spence

Bryum pseudotriquetrum var. *bimum* (Schreb. ex Brid.) Lilj. = *Ptychostomum bimum* (Schreber) J.R. Spence

Bryum pseudotriquetrum (Hedw.) Gaertn., Meyer & Scherb. = *Ptychostomum pseudotriquetrum* (Hedw.) J.R. Spence & H.P. Ramsay ex Holyoak & N. Pedersen

Bryum sandbergii Holz. = *Roellobryon roellii* (Broth.) Ochyra

Bryum stenotrichum Müll. Hal. = *Ptychostomum inclinatum* (Sw. ex Brid.) J.R. Spence .

Bryum tortifolium Funck in Brid. = *Ptychostomum cyclophyllum* (Schwägr.) J.R. Spence

Bryum torquescens Bruch ex De Not. = *Rosulabryum torquescens* (Bruch ex De Not.) J.R. Spence, q.v.

Bryum turbinatum (Hedw.) Turn. = *Ptychostomum turbinatum* (Hedw.) J.R. Spence

Bryum uliginosum (Brid.) P. Bruch & Schimp. in B.S.G. = *Ptychostomum cernuum* (Hedw.) Hornschuch

Bryum weigeli Spreng. in Biehler = *Ptychostomum weigeli* (Sprengel) J.R. Spence,

BUCKLANDIELLA Roivainen, Ann. Bot. Fenn. 9: 116. 1972. (Grimmiaceae)

Bucklandiella macounii (Kindb. in Macoun) Bednarek-Ochyra & Ochyra in R. Ochyra et al., Cens. Cat. Polish Mosses, 146. 2003.

Racomitrium brevipes Kindb., Bull. Torrey Bot. Club 16: 93. 1889.

Racomitrium heterostichum var. *macounii* (Kindb.) G.N. Jones

Racomitrium robustifolium Kindb.

Only the subsp. *macounii* is reported for Wyoming (FNA Vol. 27, 2007).

[*Bucklandiella sudetica* (Funck) Bednarek-Ochyra & Ochyra in R. Ochyra et al., Cens. Cat. Polish Mosses, 147. 2003, doubtful]

Trichostomum sudeticum Funck, Deutschl. Moose, 26. 1820.

Campylopus sudeticus (Funck) Fürnrohr.

Racomitrium heterostichum var. *sudeticum* (Funck) Dixon

Racomitrium jensenii Kindb.

Racomitrium sudeticum (Funck) P. Bruch & W.P. Schimper

Racomitrium sudeticum (unranked) *papillosum* C.E.O. Jensen

R. sudeticum var. *alaskanum* Card. & Thériot

The following reports (as *Racomitrium sudeticum* (Funck) P. Bruch & Schimp. in B.S.G.) are perhaps some other species, as *Bucklandiella sudetica* is not reported for Wyoming in FNA 2007. (As *Racomitrium sudeticum*) Teton Co., Spence (1985). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

(All as *Racomitrium sudeticum*) 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; over irrigated rocks, small cascades between lakes 19 Aug 1973, *Weber B-44279* (COLO, WTU). This specimen approached fo. *brevipes* (Kindb.) Lawt. See discussion in Crum and Anderson (1981: 450) sub *R. heterostichum* var. *microcarpon*.

BUXBAUMIA Hedw., Sp. Musc. Frond. 166. 1801. (Buxbaumiaceae)

Buxbaumia aphylla Hedw., Sp. Musc. Frond., 166. 1801.

No species of the genus *Buxbaumia* was reported for Wyoming (FNA Vol. 27, 2007).

Yellowstone Lake, Yellowstone Natl Park, collected by Conard. No specimen seen, Porter (1935).

Yellowstone Natl Park (Park Co.): ca. 7 mi from Canyon Lodge on road to Norris, 29 Aug 1951, *Lawton, 1505*, c.fr. (WTU).

Buxbaumia viridis (DC.) DC. in J.B. Mougeot et al., Stirp. Crypt. Vogeso-Rhen. 8: 724. 1823.

Buxbaumia aphylla var. *viridis* DC. in J. Lamarck and A.P. de Candolle, Fl. Franç. ed. 3, 6: 227. 1815.

Buxbaumia indusiata Brid.

Found in all states of the Pacific Northwest, but not common. Teton Co., Spence (1985).

Lincoln Co.: on well-rotted log in partial clearing on spruce-fir slope along Porcupine Creek, Greys River Valley, Salt River Range, 18 mi SE Alpine Junction, 6600 ft, 30 Aug 1973, *Hermann 25593*, c.fr. (WTU).

CALLIERGON (Sull.) Kindb., Canad. Rec. Sci. 6: 72. 1894. (Calliergonaceae)

Calliergon cordifolium (Hedw.) Kindb., Canad. Rec. Sci. 6: 72. 1894.

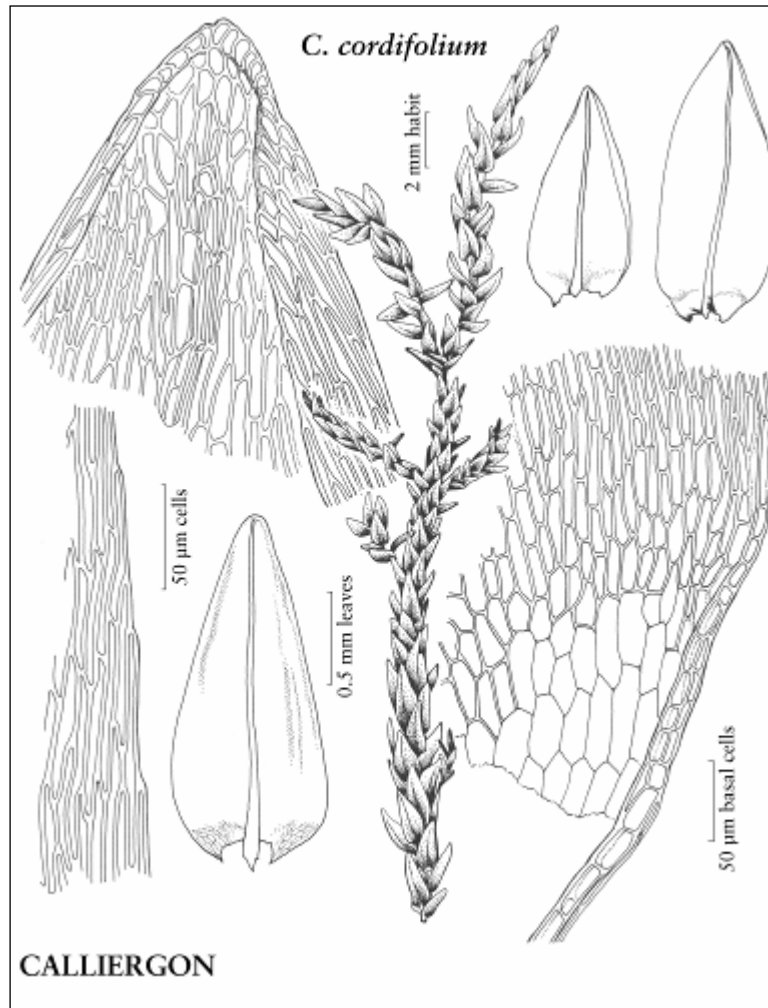
Hypnum cordifolium Hedw., Sp. Musc. Frond., 254. 1801.

Calliergon cordifolium (Hedw.) Kindb.

Calliergon cordifolium fo. *intermedium* Grout

Not reported for Wyoming (FNA); “*Calliergon cordifolium* is most frequently confused with the dioicous *c. giganteum* when the latter species does not form its characteristic miniature sprucelike shoots” (Hedenäs, FNA Vol. 28, 2014). Yellowstone Lake, Yellowstone Natl Park (*Smiley*); Carbon County (*Porter 1694*), Porter (1935). Carbon Co., Yellowstone Natl Park, Porter (1937). Sublette Co., Cooper & Andrus (1994). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Park Co.: wet soil in white spruce fen at base of Cathedral Cliff, 2 mi E of Crandall Ranger Station, 6600 ft, 12 Aug 1990, *Elliott 1778* (BUF). Carbon Co.: Stampmill Lake, with *Sphagnum* in an alpine bog mat, 10,000 ft, *Porter 2084* (TENN); near Silver Lake, mixed with *Sphagnum* in a floating mat in a bog, 10,000 ft, *Porter 1694* (TENN).



Courtesy FNA Association, FNA 28, 2014

Calliergon giganteum (Schimper) Kindb., *Canad. Rec. Sci.* 6: 72. 1894.

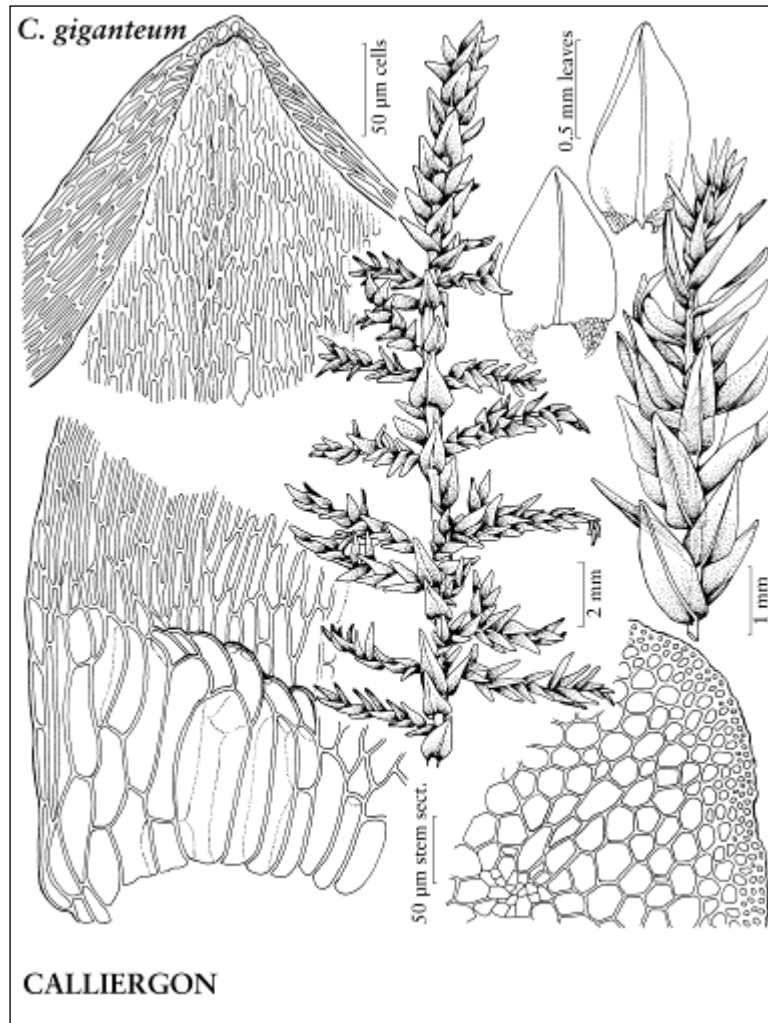
Hypnum giganteum Schimper, *Syn. Musc. Eur.*, 642. 1860.

Calliergon subsarmentosum Kindb.

Hypnum cyclophyllotum Holz.

Wyoming: “Plants of *Calliergon giganteum* frequently resemble miniature spruce trees because of dense and successively longer branches from the shoot apex downwards, regular radial branching, and somewhat spreading branch leaves” (Hedenäs, FNA Vol. 28, 2014). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: 8500 ft, *Hermann 25607* (RM), same locale, 9700 ft, *Sturges 251* (RM); NW base of Sheep Mtn. along WY 11, ca. 4 air mi ESE of Centennial, seep area (calcareous fen) with *Populus*, *Betula*, and *Salix*, *Buck 23240* (NY); ca. 4 air mi ESE of Centennial, NW base of Sheep Mountain along WY 11, 7700–7900 ft, *Populus*, *Betula*, and *Salix*, associated with spring seep, open fen, 7 Jun 1993, *Miller 10*, 274 (NYS).



Courtesy FNA Association, FNA 28, 2014

Calliergon richardsonii (Mitt.) Kindb., Eur. N. Amer. Bryin. 1: 80. 1897 (as richardsoni).

Stereodon richardsonii Mitt., J. Linn. Soc., Bot. 8: 42. 1864 (as richardsoni).

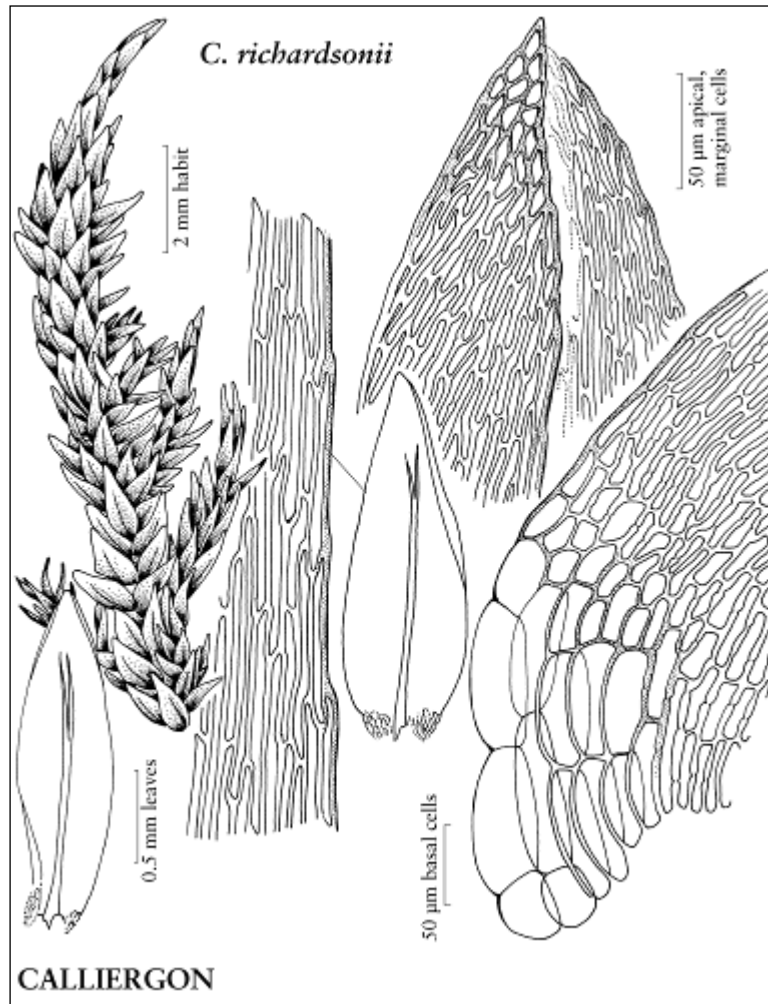
Calliergon macounii Karczmarz

Calliergon obtusifolium Karczmarz

Calliergon subgiganteum Kindb.

Hypnum richardsonii (Mitt.) Lesq. & James

Wyoming; “*Calliergon richardsonii* is easily separated from other members of *Calliergon* by its comparatively short, usually branched or 2-fid stem leaf costa” (Hedenäs, FNA Vol. 28, 2014). Wyoming: Lawton (1971). Crum and Anderson (1981: 1003) mention a report from Wyoming but did not see a specimen. Johnson Co., reported by Lenz (2006) in association with *Warnstorfia tundrae*. Perhaps they are referring to Lawton's citation. Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).



Courtesy FNA Association, FNA 28, 2014

Calliergon sarmentosum (Wahlenb.) Kindb. = *Sarmenthypnum sarmentosum* (Wahlenberg)
Tuomikoski & T. Koponen

Calliergon stramineum (Brid.) Kindb. = *Straminergon stramineum* (Dickson ex Brid.)
Hedenäs

Calliergon trifarium (F. Weber & D. Mohr) Kindb. = *Pseudocalliergon trifarium* (F. Weber & D.
Mohr) Loeske

Calliergon turgescens (T. Jens.) Kindb. = *Pseudocalliergon turgescens* (T. Jens.) Loeske

CALLIERGONELLA Loeske, *Hedwigia* 50: 248. 1911. (Amblystegiaceae)

Calliergonella cuspidata (Hedw.) Loeske, *Hedwigia* 50: 248. 1911.

Hypnum cuspidatum Hedw., *Sp. Musc. Frond.*, 254. 1801.

Acrocladium cuspidatum (Hedw.) Lindb.

Calliergon cuspidatum (Hedw.) Kindb.

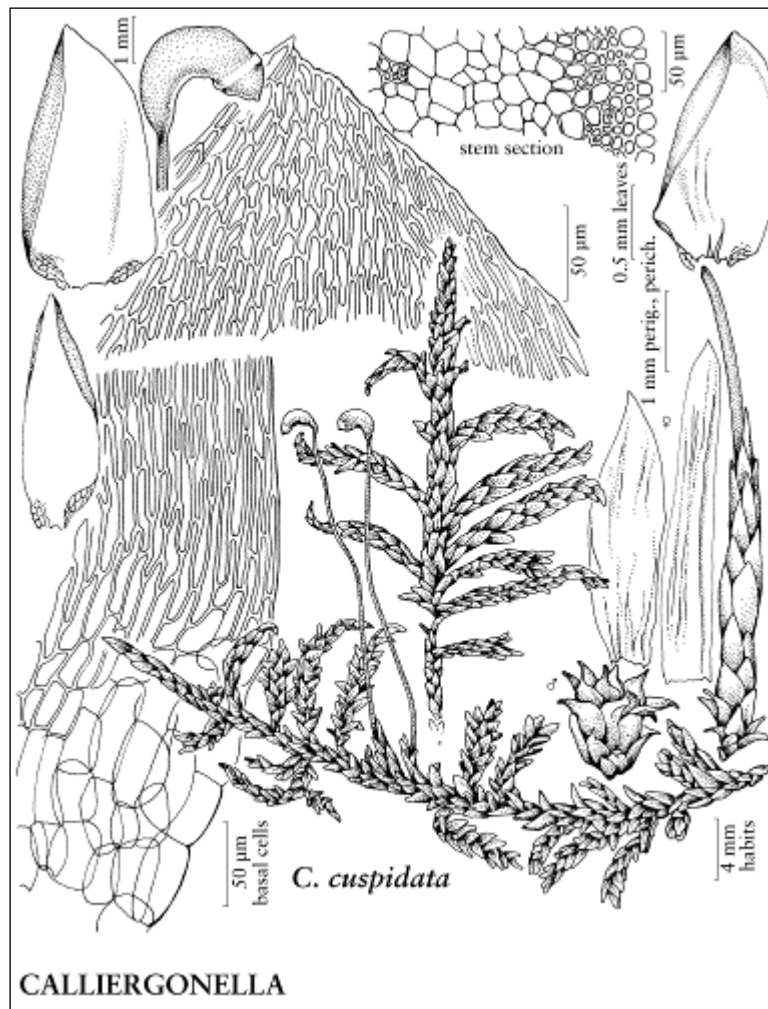
Calliergon cuspidatum (Hedw.) Kindb.

Calliergonella conardii Lawt.

Wyoming (FNA Vol. 28, 2014). (As *Hypnum cuspidatum*) Wyoming: Yellowstone Natl Park (1579), Roell (1893). Ireland 1982. Sublette Co., Cooper & Andrus (1994).

Park Co.: (with *Hygrohypnum styriacum* specimen, q.v.): Beartooth Lake, W and SW shore, *Picea engelmannii* forest along the shore, on wet clay, assoc. with *Sanionia uncinata*, *Calliergonella cuspidata*, T57N R105W S6&7, 44°56.500–520' N, 109°35.980–990' W, ca. 8900 ft (2700 m), 24 Jul 2010, *Kosovich-Anderson 6652* (no herb. cited). Yellowstone Natl Park: Lost Lake, 17 Aug 1953, *Lawton 1821* (isotype, WTU); with *Dichelyma uncinata*, Lost Lake near Roosevelt Lodge, 28 Aug 1951, *Lawton 1495* (WTU); 9 mi S of Madison Junction, 29 Aug 1951, *Lawton 1512* (WTU). Yellowstone Natl Park: Black Sand Basin, 18 Aug 1953, *Lawton 1866* (WTU).

This species may be confused with *Hygrohypnum ochraceum* in its softer, non calcium-encrusted forms, but that species may be distinguished by the much longer forked costa extending to the leaf middle and somewhat beyond, whereas *C. cuspidata*'s costae are short.



Courtesy FNA Association, FNA 28, 2014

[*Camptothecium lutescens* (Hedw.) Schimp. in B.S.G. = *Homalothecium lutescens* (Hedw.) Robinson, q.v. Excluded from North America (1990 checklist and FNA Vol. 28, 2014).]

CAMPYLIADELPHUS (Kindb.) R.S. Chopra, *Taxon*. Indian Mosses, 442. 1975.
(Amblystegiaceae)

Campyliadelphus chrysophyllus (Brid.) Kanda, *J. Sci. Hiroshima Univ., Ser. B, Div. 2, Bot.* 15: 264. 1976.

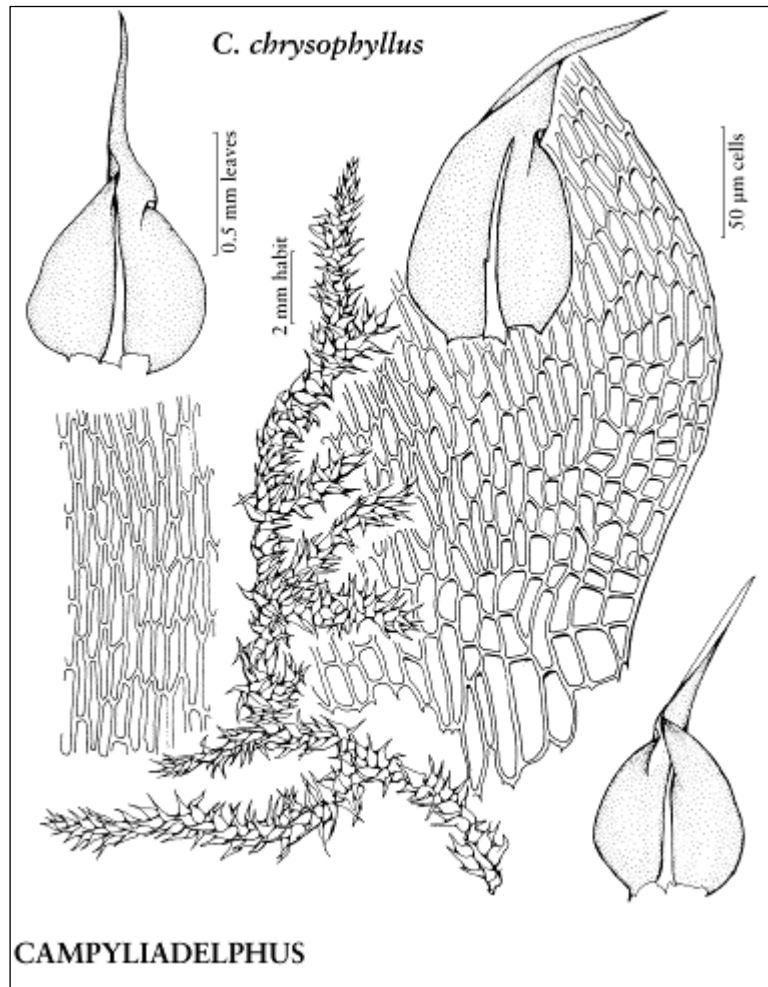
Hypnum chrysophyllum Brid., *Muscol. Recent.* 2(2): 84, plate 2, fig. 2. 1801.

Campylium chrysophyllum (Brid.) Lange

Campylium chrysophyllum var. *brevifolium* (Ren. & Card.) Grout

Hypnum chrysophyllum var. *brevifolium* Ren. & Card.

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



Courtesy FNA Association, FNA 28, 2014

(All as *Campylium chrysophyllum*) Albany Co.: 8500 ft, *Hermann 17773* (RM); ca. 4 air mi ESE of Centennial, NW base of Sheep Mountain along WY 11, 7700–7900 ft, *Populus*, *Betula*, and *Salix* associated with spring seep, fen area, on soil bank, 7 Jun 1993, *Miller 10,277*, with *Leptobryum pyriforme* and *Henediella heimii* (NYS). Natrona Co.: S of I-25, take Center St. to Wolcott St. to Casper Mtn. Drive WY 252, Rotary Club Park in N-slope foothills, wooded creek ravine, *Salix*, *Ribes*, *Alnus*, granite rocks, with *Cratoneuron filicinum*, 7 Jul 1985, *Eckel 94100400* (BUF). Sweetwater Co.: ca. 6400 ft, on US (187)191 at 14-Mile Reservoir picnic area, US Dept. Interior, wet

wooden bridge over brooklet, shaded ravine in *Artemisia* scrubland, with *Henediella heimii*, 5 Jul 1985, *Eckel 212086* (BUF). Teton Co.: on US 26 & US 237, 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, with *Drepanocladus aduncus*, *Distichium capillaceum*, *Aulacomnium palustre*, *Brachythecium salebrosum*, *Cratoneuron filicinum*, 6 Jul 1985, *Eckel 94082108* (BUF). Weston Co.: Beaver Creek, *Nelson 2563* (RM).

CAMPYLIUM (Sull.) Mitt., J. Linn. Soc., Bot. 12: 631. 1869. (Amblystegiaceae)

Hypnum sect. Campylium Sull. in A. Gray, Manual ed. 2, 677. 1856.

Species of *Campylium* seem to approach the appearance of *Conardia compacta* in the Amblystegiaceae—that species has long, almost vermicular leaf cells rather than the boxy cells of the Amblystegiaceae generally. That species also has a longer costa than in any species of *Campylium*, which goes to the leaf middle or somewhat above. Also *C. compacta* has distinctive irregular serrations at the basal margins.

Campylium chrysophyllum (Brid.) J. Lange = *Campyliadelphus chrysophyllus* (Brid.) Kanda

Campylium hispidulum (Brid.) Mitt. = *Campylophyllum hispidulum* (Brid.) Hedenäs

Campylium polygamum (Schimp. in B.S.G.) C. Jens. = *Drepanocladus polygamus* (Schimper) Hedenäs

Campylium protensum (Brid.) Kindb., Canad. Rec. Sci. 6: 72. 1894.

Hypnum protensum Brid., Muscol. Recent. 2(2): 85, plate 2, fig. 3. 1801.

Campyliadelphus protensus (Brid.) Kanda

Campylium stellatum var. *protensum* (Brid.) Bryhn

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

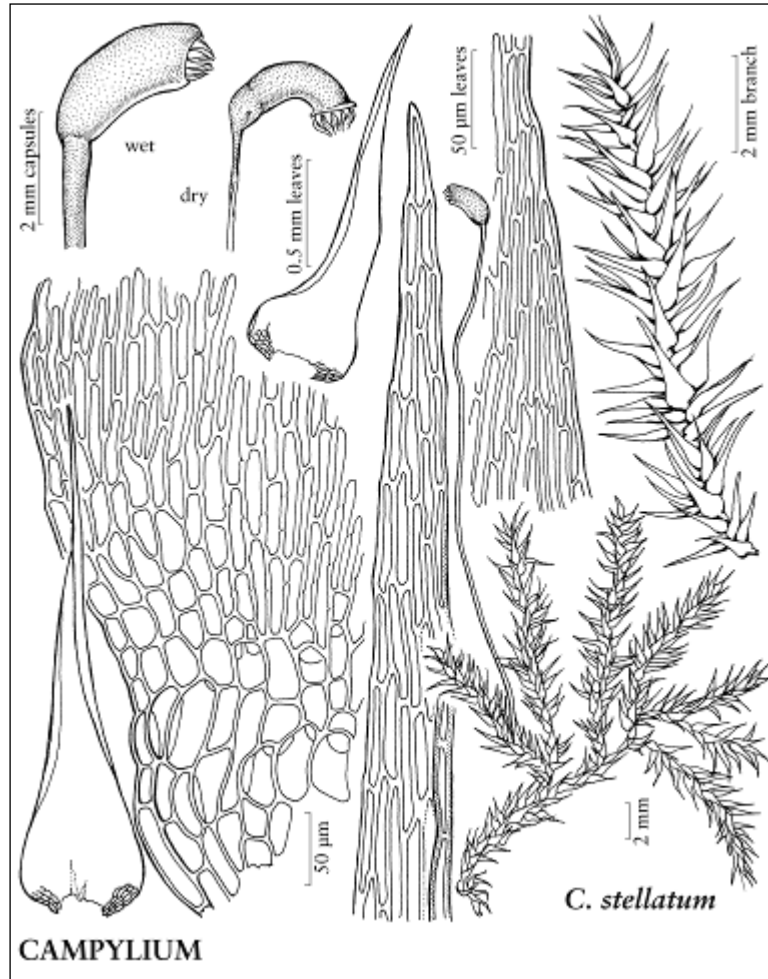
Campylium stellatum (Hedw.) C.E.O. Jensen, Meddel. Grønland 3: 328. 1887.

Hypnum stellatum Hedw., Sp. Musc. Frond., 280. 1801.

Campyliadelphus stellatus (Hedw.) Kanda

Wyoming (FNA Vol. 28, 2014). Beaver Creek, Weston County, (*Nelson 2556*), Porter (1935). Weston Co., Porter (1937). Sublette Co., Cooper & Andrus (1994). Johnson Co., in association with *Warnstorfia tundrae*, Lenz 2006). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: peaty vertical bank of streamlet in mtn. meadow, 1 1/4 mi S of Brooklyn Lake, 10,000 ft, Medicine Bow Mts, 9 mi W of Centennial, *Hermann 17679 1/2* (RM). Carbon Co.: wet, rocky edge of Trail Creek, W of Sand Lake Rd, 9000 ft, Medicine Bow Mountains, 4 1/2 mi SW of Morgan, *Hermann 17807* (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 1716* (BUF). Sublette Co.: Bridger Wilderness, Wind River Range 14 May 1989, Barnes Lake, 42°57'30" N, 109°36' W, mineralized seeps at S end of lake, 9747 ft, *Andrus 7786* (BING). Weston Co.: Beaver Creek, *Nelson 2556* (RM).



Courtesy FNA Association, FNA 28, 2014

CAMPYLOPHYLLUM (Schimper) m Fleischer, Nova Guinea 12: 123. 1914. (Amblystegiaceae)
Hypnum subg. *Campylophyllum* Schimper, Syn. Musc. Eur. ed. 2, 721. 1876.

Campylophyllum hispidulum (Brid.) Hedenäs, Bryologist 100: 74. 1997.

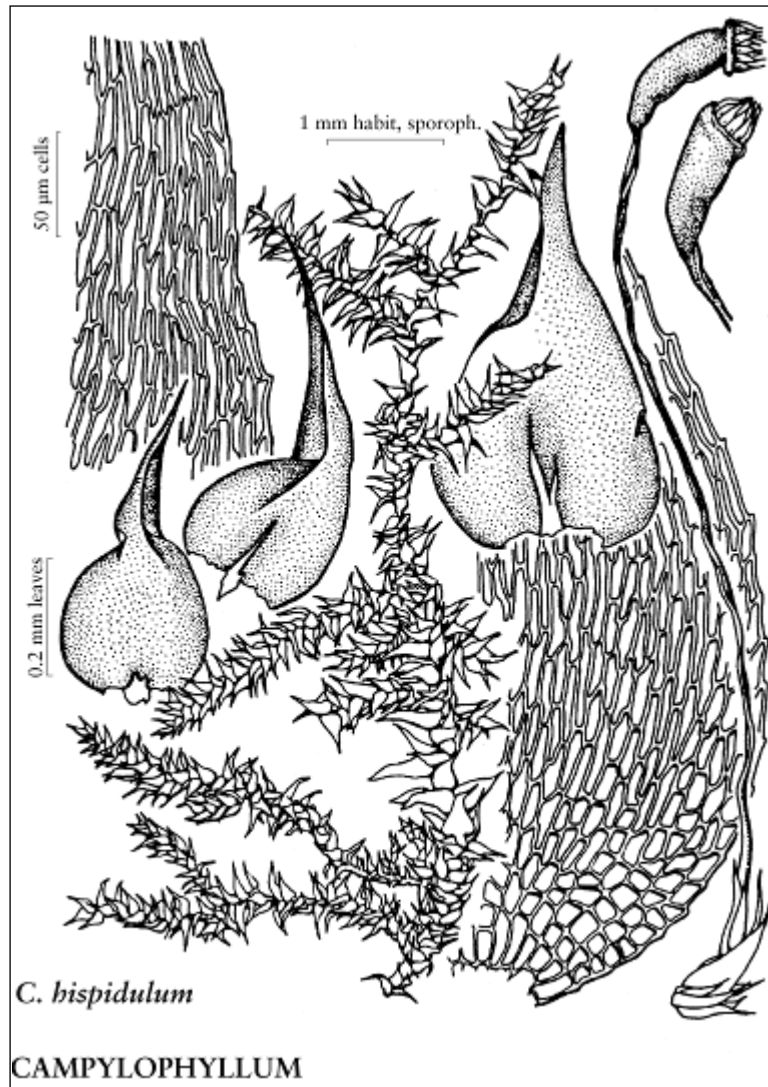
Hypnum hispidulum Brid., Muscol. Recent., suppl. 2: 198. 1812.

Campylium hispidulum (Brid.) Mitt.

Campylium hispidulum var. *cordatum* Grout

Not reported for Wyoming in FNA (FNA Vol. 28, 2014). (As *Campylium hispidulum*)
 Cooper Hill, Albany County (Nelson 4296); Beaver Creek, Weston County (Nelson 2563), Porter
 (1935). Albany, Weston Cos., Porter (1937).

(As *Campylium hispidulum*) Albany Co.: Medicine Bow Mts., Medicine Bow Natl Forest,
 Barber Lake Picnic Area, 2.5 air mi NW of Centennial, *Pinus contorta* forest along Libby Creek,
 2660 m, Buck 23189, in specimen labeled *Amblystegium serpens*, with *Brachythecium cirrosum*,
 associated with rotten wood (NY).



Courtesy FNA Association, FNA 28, 2014

CAMPYLOPUS Brid., Muscol. Recent., suppl. 4: 71. 1818. (Dicranaceae)

Campylopus fragilis (Brid.) P. Bruch & W.P. Schimper, Bryol. Europ. 1: 164. 1847.

Dicranum fragile Brid., J. Bot.(Schrader) 1800: 296. 1801.

Campylopus citrescens Stirt.

Not reported for Wyoming in FNA (FNA Vol. 27, 2007, where it is noted only from British Columbia and “a single locality in Arkansas” (Frahm, FNA Vol. 27, 2007).

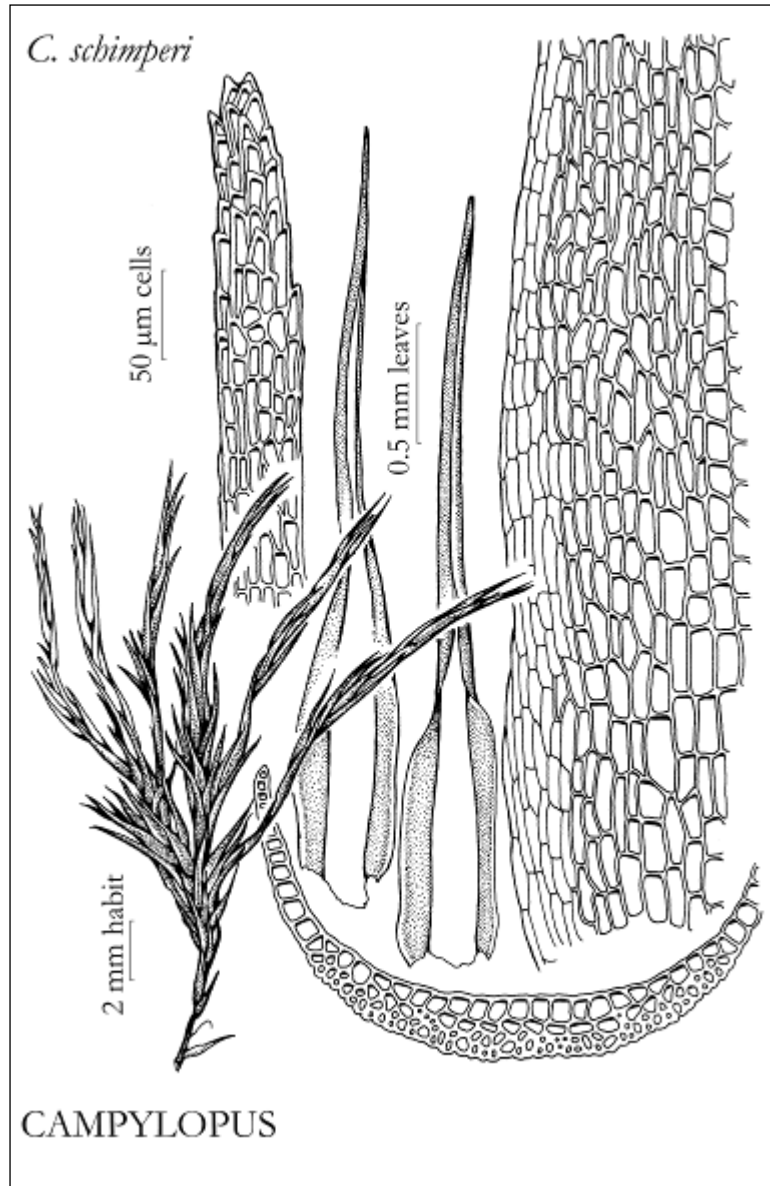
Yellowstone Natl Park: ca. 5 mi from Canyon Lodge, road to Norris, 29 Aug 1951, *Lawton 1498* (WTU).

This specimen is differentiated from the similar *Campylopus schimperi* Milde by the presence of stereid cells on the dorsal side of the costa in Sect., whereas the cells of *c. schimperi* are said to be too wide to qualify as stereids. *Campylopus schimperi* is smooth on the back of the costa (Crum & Anderson 1981), whereas *C. fragilis* has ridges (Smith 1978).

Campylopus schimperi Milde, Bot. Zeitung (Berlin) 22: 13. 1864.
Campylopus subulatus var. *schimperi* (Milde) Husnot

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

Park Co.: Beartooth Plateau, Little Bear Lake vicinity, subalpine aapa mire fen crossed by US Hwy 212, in pure mats on saturated soil at base of low hummock around swale, T57N, R105W, S11, 4456.260–290' N, 10930.920–950' W, 2910 m, 16 Aug 2008, *Kosovich-Anderson 2896* (BONN, MO, RM), Kosovich-Anderson (2011a).



Courtesy FNA Association, FNA 28, 2014

Campylopus talluensis Sull. & Lesq., Musci Bor.-Amer. 73b [Schedae 17]. 1856 [1857].

Wyoming (FNA Vol. 27, 2007).

Yellowstone Natl Park: Heart Lake, hot water formation, *Streeter s.n.* (DUKE).

“*Campylopus talluensis* occurs in southeastern North America in Virginia, North and South Carolina, Tennessee, Georgia, Arkansas, Alabama, Ohio and Louisiana with disjunct occurrences in the west in southern Arizona and Wyoming. It is also known from Mexico—where it is rather common, Bolivia and Colombia. This distribution pattern in southeastern United States, Mexico and northern South America, which is characteristic of other bryophytes and flowering plants, is considered indicative of Tertiary relictual status (Crum 1951 dissertation). Because of confusions with *c. flexuosus*, the total range of *c. talluensis* is not yet sufficiently known” (Frahm 1980).

CERATODON Brid., Bryol. Univ. 1: 480. 1826. (Ditrichaceae)

Ceratodon purpureus (Hedw.) Brid., Bryol. Univ. 1:480. 1826.

Dicranum purpureum Hedw., Sp. Musc. Frond., 136, plate 36. 1801.

Ceratodon columbiae Kindb.

Ceratodon conicus (Hampe) Lindb.

Ceratodon purpurascens (Hedw.) Jennings

Ceratodon purpureus var. *purpurascens* (Hedw.) Brid.

Ceratodon purpureus var. *xanthopus* Sull.

Dicranum purpurascens Hedw.

Trichostomum conicum Hampe in Müll. Hal.

subsp. **purpureus**

Wyoming (FNA Vol. 27, 2007). Wyoming: Yellowstone Natl Park, 7000' (1448), Roell (1893). Yellowstone Canyon, Yellowstone Natl Park (*Smiley*), Porter (1935). Common throughout most of the State; Albany County, Carbon, Crook, Johnson, Sheridan, Teton Counties and 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).

Albany Co.: 8500 ft, 10,500 ft, *Lichvar 1339* (RM); *1328* (RM). Bighorn Co.: just off US 16 between TenSleep & Buffalo (near Sitting Bull Campsite), *Pinus contorta* var. *latifolia* being lumbered, just N of Washakie Co. border, ca. 5000 ft, disturbed soil, *Bryum lisae* var. *cuspidatum*, 6 Jul 1985, *Eckel 94092201* (BUF, RM). Carbon Co.: (in specimen of *Desmatodon latifolius*), rotted wood in soil in lodgepole pine woods along Trail Creek, Sand Lake Rd., 9000 ft, Medicine Bow Mts., 4.5 mi SW Morgan, *Hermann 17813* (WTU). Crook Co.: Devils Tower Natl. Monument, summit of Devils Tower, Jul 1990, *Fortney s.n.* (BUF, NY). Fremont Co.: 23 Jun 1931, *Frye s.n.* (RM). Park Co.: 6000 ft, 1 Apr 1988, *Vukelich s.n.* (BUF). Johnson Co.: Big Horn Mtns., along Middle Fork Crazy Woman Creek, stream bank, 8200 ft, *Nelson 3584*, in packet of *Bryum pallescens* (RM). Lincoln Co.: basalt outcrop, 6700 ft, *Hermann 25597*, as *Ceratodon purpureus* var. *dimorphus* (RM). Sublette Co.: Bridger Wilderness, Wind River Range, ca. 1.5 mi E of Barnes Lake, 10,080 ft, 42°58' N, 109°34' W, thin peat terrace, 17 May 1989, *Andrus 7866* (BING). Weston Co.: *Eckel 523686* (RM, BUF). Yellowstone Natl Park: 14 Aug 1925, *Frye s.n.* (RM); Yellowstone Park, *Taylor 67-161* (RM); Yellowstone Natl Park between Old Faithful and Madison near Great Fountain in *Pinus contorta* forest in northern exposures, primitive rocks, ca. 2460 m, *Duell 2265* (BUF).

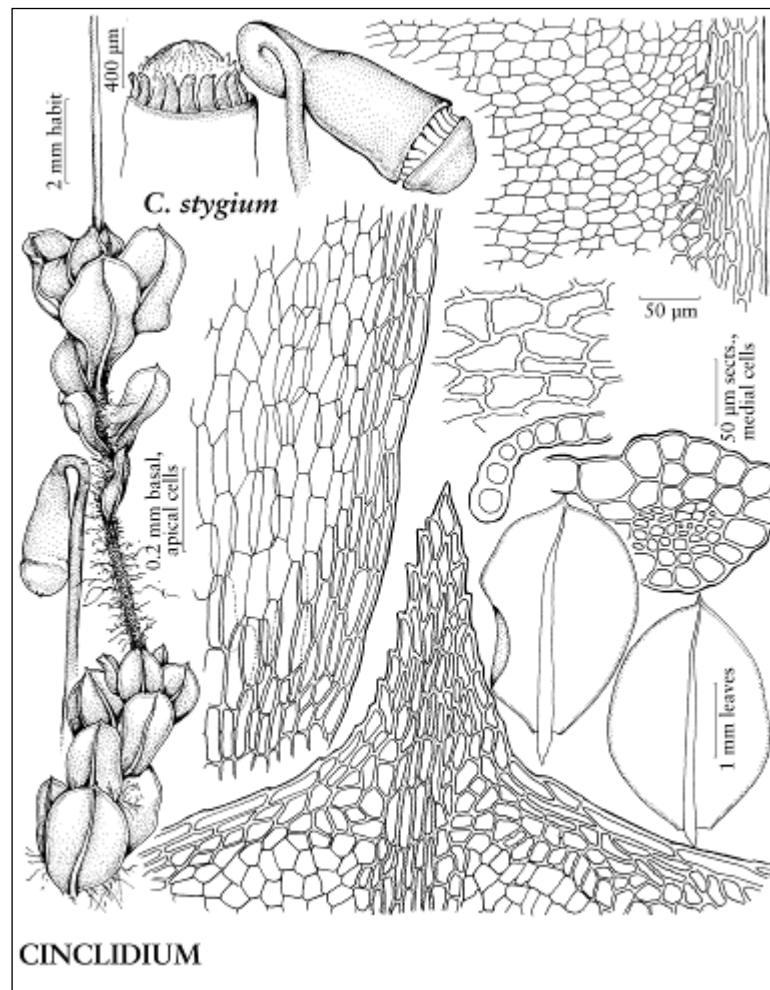
A weedy species found in almost every type of habitat, on soil, soil over rock, etc., in the Pacific Northwest on shaded roofs of houses in the city; cosmopolitan, extremely common, widespread throughout the United States and Canada. Distinguished from *Cynodontium* by leaves having no papillae, even on the margins; from *Oncophorus* by not being subulate and by being strongly revolute nearly to the apex; from *Dicranoweisia* species by either being recurved or not bistratose anywhere; from *Ditrichum* species by the non-subulate, non-awned leaves, by never being bistratose and by being recurved. When it has sharp pointed teeth at the apex, it is not a *Bryoerythrophyllum recurvirostrum* since its leaf cells are smooth (not papillose).

CINCLIDIUM Sw., J. Bot. (Schrader) 1801(1): 27, plate 2. 1803. (Mniaceae)

Cinclidium stygium Sw., J. Bot. (Schrader) 1801(1): 27, plate 2. 1803.

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 1732* (BUF, NYS).



Courtesy FNA Association, FNA 28, 2014

Cirriphyllum cirrosum (Schwaegr. in Schultes) Grout = *Brachytheceium cirrosum* (Schwägr.) Schimp.

CLIMACIUM F. Weber & D. Mohr in F. Weber, Naturh. Reise Schweden, 96. 1804.
(Climaceaceae)

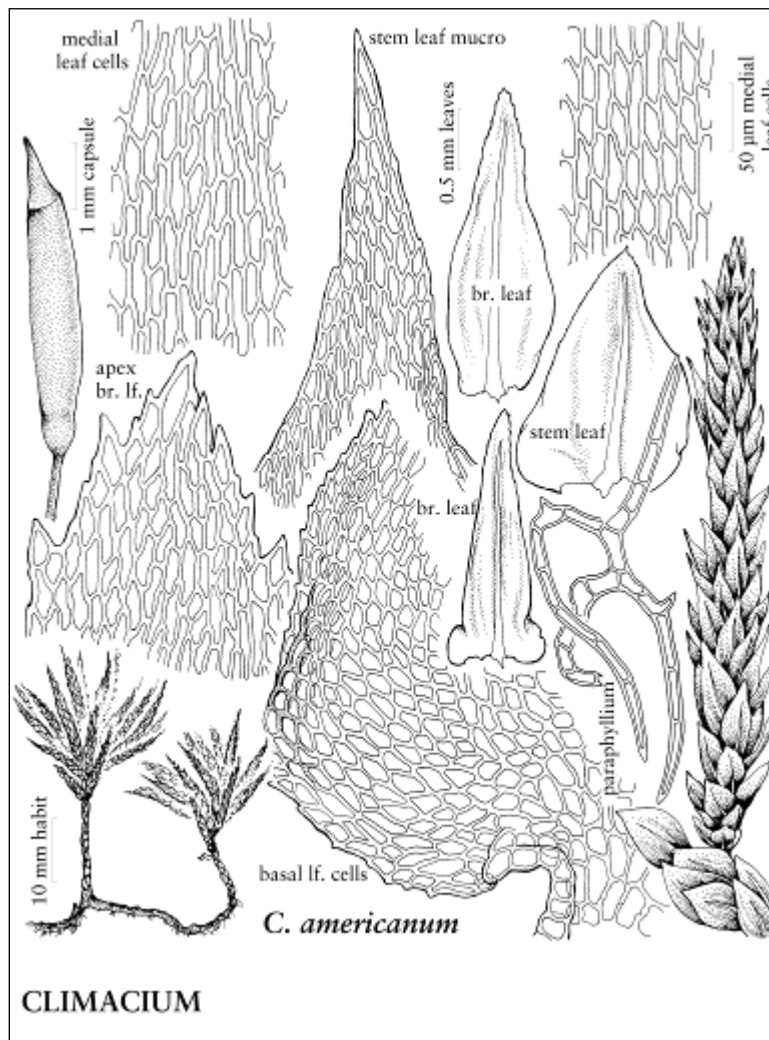
Climacium americanum Brid., Muscol. Recent., suppl. 2: 45. 1812.

Climacium americanum subsp. *kindbergii* (Ren. & Card.) Kindb.

Climacium americanum var. *kindbergii* Ren. & Card.

Climacium americanum var. *pseudokindbergii* Card. & Thériot

Climacium kindbergii (Ren. & Card.) Grout



Courtesy FNA Association, FNA 28, 2014

Wyoming (FNA Vol. 28, 2014). Lawton (1971: 235) does not distinguish *C. americanum* as separate from *C. dendroides*. "Specimens from Wyoming have been determined as *C. americanum*, and it is found in central and eastern North America as far south as Tennessee." Centennial, Albany County (*Nelson 1724*), Porter (1935). Teton Co., Spence (1985). (As *Climacium kindbergii*) "In a small peat bog," Carbon County (*Porter 1752*), Porter (1935).

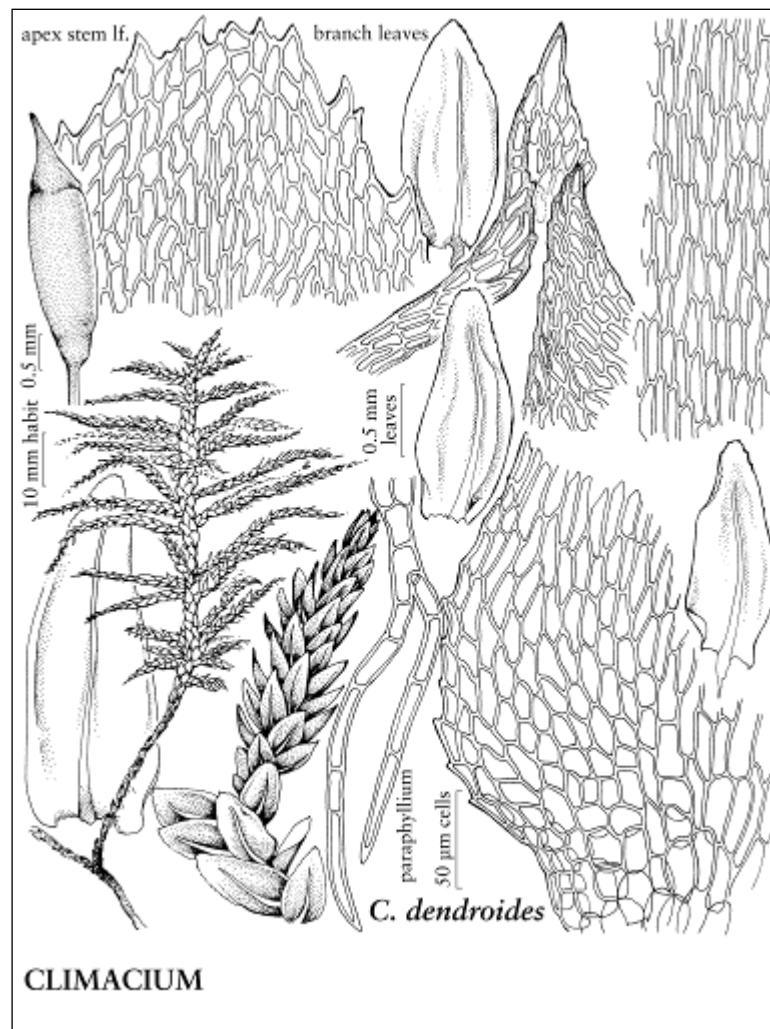
Sublette Co.: Bridger Wilderness, Wind River Range, Barnes Lake, 42°57'30" N, 109°36' W, mineralized seeps at S end of lake, 9747 ft, 14 May 1989 *Andrus 7800*, auriculate leaves, short cells (BING).

This taxon is now accepted in the North American Checklist (Anderson et al. 1990). Crum & Anderson (1981: 1231) had regarded it as only a response to inundation, with plants long and trailing “somewhat like a *Fontinalis* in field appearance. The branching is irregular. The leaves are broadly rounded at the base but not particularly auriculate, the upper cells are rhombic and only about 2–4: 1, and a few large, lax cells are found in the alar region.”

Climacium dendroides (Hedw.) F. Weber & D. Mohr in F. Weber, *Naturh. Reise Schweden*, 96, 1804.

Leskea dendroides Hedw., *Sp. Musc. Frond.*, 228. 1801.

Climacium dendroides var. *oregonense* Ren. & Card.

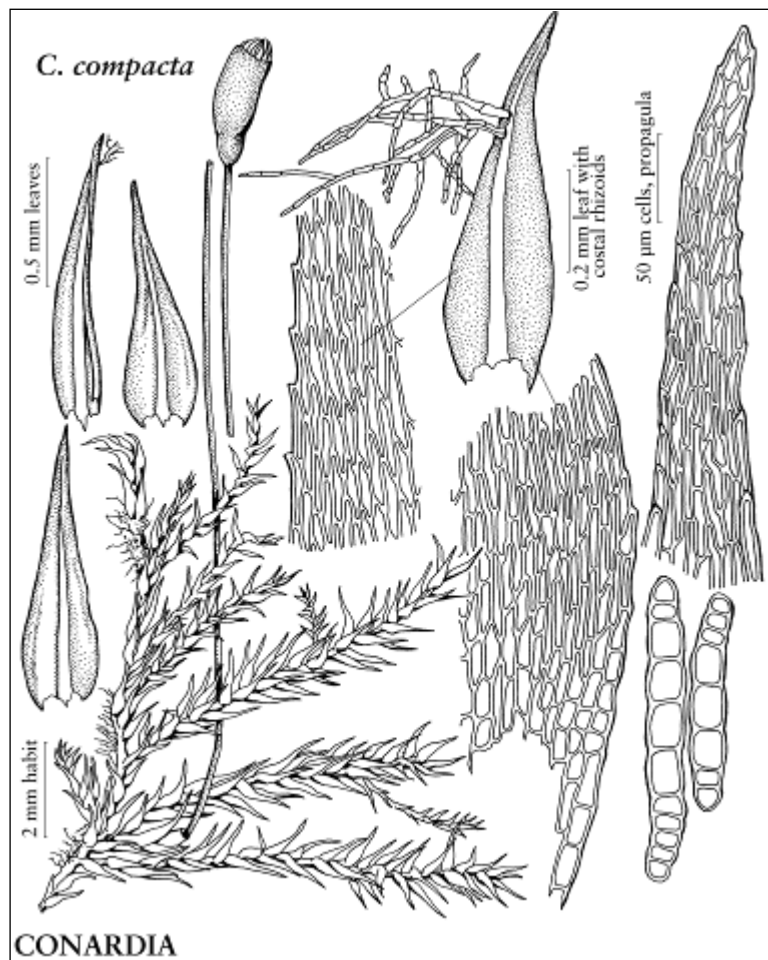


Courtesy FNA Association, FNA 28, 2014

Wyoming (FNA Vol. 28, 2014). Wyoming: Yellowstone Natl Park (1532), Roell (1893). In Park Co. *Climacium dendroides* forms a rich bryophyte community combined with *Aulacomnium palustre*, *Hylocomium splendens*, *Elodium blandowii*, *Rhizomnium* spp., *Thuidium recognitum*, *Marchantia alpestris*, (*Thuidium recognitum*, q.v.) and others” (Kosovich-Anderson & Weber 2011).

Yellowstone Natl Park, specimen number 1532, Roell (1893). Albany County, Teton County, and Yellowstone Natl Park, Porter (1935). Albany, Carbon, Teton Cos., Yellowstone Natl Park, Porter (1937). Teton Co., Spence (1985). Sublette Co., Cooper & Andrus (1994). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: 9700 ft, *Sturges 250* (RM); Centennial Valley, 18 Aug 1895, *Nelson 1724* (RM). Carbon Co.: on the floating mat of a peat bog, near Silver Lake, Medicine Bow Mtns, 10,500 ft, *Porter 1752* (RM). Johnson Co.: Big Horn Natl Forest, Hunter Quadrant (A), Cloud Peak Wilderness Area, T50N R81W, Sect. 29, wet area W of Circle Park Campground, 8120 ft, 20 Aug 1992, *Zacharkevics s.n.* (BING). Park Co.: Beartooth Plateau, swales around small lakes, subalpine zone, Long Lake & lower Shepherder Lakes, 2900 m, *Weber s.n.* (COLO, RM). Sublette Co.: 10,324 ft, *Rolston 85131* (c). Yellowstone Natl Park: along the Yellowstone River just above the Falls, on ground, 7 Jul 1934, *Frye s.n.* (RM).



Courtesy FNA Association, FNA 28, 2014

CONARDIA H. Robinson, *Phytologia* 33: 294. 1976. (Amblystegiaceae)

Conardia compacta (Hook.) H. Robinson, *Phytologia* 33: 295. 1976.

Hypnum serpens var. *compactum* Hook. in T. Drumm., *Musc. Amer.* 188. 1828.

Hypnum compactum Müll. Hal.

Amblystegium americanum Grout
Amblystegium compactum (Müll. Hal.) Aust.
Amblystegium dissitifolium Macoun & Kindb.
Amblystegium holzingeri (Grout) Grout
Amblystegium subcompactum Macoun & Kindb.
Brachythecium collinum var. *holzingeri* Grout
Rhynchostegiella compacta (Müll. Hal.) Loeske
Rhynchostegiella compacta subsp. *americana* (Grout) Wijk & Margadant

Not yet reported for Wyoming (FNA Vol. 28, 2014). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: NW base of Sheep Mtn, along WY 11, ca. 4 air mi ESE of Centennial, seep area (calcareous fen) with *Populus*, *Betula*, and *Salix*, *Buck 23249* (NY). Fremont Co.: Dubois, Fish Hatchery, 12 Aug 1953, *Lawton 1721*, c.fr. (WTU). Park Co.: wet soil in white spruce fen at base of Cathedral Cliff, 2 mi E of Crandall Ranger Station, 6600 ft, 19 Apr 1992, *Elliott 1941* (BUF). Yellowstone Natl Park: Clematis Gulch Trail, 16 Aug 1953, *Lawton 1784*, c fr. (WTU).

Might be confused at first with *Campylium* because of the long, narrow leaf tips, but the costa here is longer—to the leaf tip to percurrent, which never happens in *Campylium*. Perhaps the most distinctive feature of this species are the marginal cells at the base that have sharp serrations which are heterogeneous in shape, one or two of which might appear to be recurved and may be composed of the top of one cell and the base of the one above it.

CODRIOPHORUS P.-Beauv., Mém. Soc. Linn. Paris 1: 445. 1822. (Grimmiaceae)

[*Codriophorus acicularis* (Hedw.) P.-Beauv., Mém. Soc. Linn. Paris 1: 445. 1823 (as *aciculare*), excluded]

Dicranum aciculare Hedw., Sp. Musc. Frond., 135. 1801.
Grimmia acicularis (Hedw.) Müll. Hal.
Grimmia nevii Müll. Hal.
Racomitrium aciculare (Hedw.) Brid.
Racomitrium nevii (Müll. Hal.) S. Watson
Trichostomum aciculare (Hedw.) P.-Beauv.

Not recognized for Wyoming but to be expected (FNA Vol. 27, 2007) in high elevations in the Rocky Mountains. Wyoming: Yellowstone Natl Park (*1453*), Roell (1893).

[*Codriophorus fascicularis* (Hedw.) Bed.-Ochyra & Ochyra in R. Ochyra et al., excluded]

Racomitrium fasciculare (Hedw.) Brid.

Not recognized for Wyoming by FNA (FNA Vol. 27, 2007). (As *Racomitrium fasciculare*) “Jackson Lake, Teton County (Coulter, in 1872). No specimens of this species were found in the Rocky Mountain Herbarium, although the species is listed by Nelson (1900). “Has been reported for Wyoming as having been collected by Coulter in the northwest part of the State in 1872. No specimen of this collection has been seen by the writer, and it is believed that it should better be referred to the following species [*R. canescens*]. [This] species is a plant of more northern range,” Porter (1935). Teton Co.: Spence (1985), however, Spence cites Porter (1935) for the occurrence of this species.

COSCINODON Sprengel, Anleit. Kenntn. Gew. 3: 281. 1804. (Grimmiaceae)

Coscinodon calyptratus (Drummond) C.E.O. Jensen in N. C. Kindb., Eur. N. Amer. Bryin. 2: 241. 1897.

Grimmia calyptrata Drumm., Musc. Amer., 60. 1828.

Coscinodon calyptratus (Hook.) C. Jens.in Kindb.

Coscinodon hookeri Hampe

Grimmia columbica Kindb.

Guembelia calyptrata (Hook.) Müll. Hal.

Wyoming (FNA Vol. 27, 2007). In all states and provinces of the Pacific Northwest; California, Arizona, New Mexico, Nevada, Utah, Colorado. Common on granite rocks, especially in the southern part of the State. Albany County (*Porter 1012, 480, 626*), Sublette County (*Porter 1124*), Porter (1935). Weston Co., Wynne (1943). Campbell Co., Medina (1994).

Albany Co.: crevice in granite boulder in Lodgepole woods above Libby Creek Picnic Ground, Snowy Range, 2 1/2 mi NW of Centennial, 8700 ft, 7 Jun 1972, *Hermann 24864* (RM); Willow Creek, 22 May 1897, *Nelson 2917* (RM). Big Horn Co.: Big Horn Natl. Forest, Lake Helen Quad., Cloud Peak Wilderness Area, 10,200 ft, 3 Aug 1992, *Zacharkevics s.n.* (BING). Lincoln Co.: tight dense polsters on boulder in Greys River, 7 mi S of Twin Creek, Salt River Range, 44 mi SSE of Alpine Junction, 6700 ft, 30 Aug 1973, *Hermann 25605* (RM). Platte Co.: *Eckel 820386* (RM, BUF). Park Co.: 10 Jun 1990, *Parsons s.n.* (BUF, RM). Sweetwater Co.: on the sides of a big rock, Bush Ranch, 10 Jun 1900, *Nelson 7092* (RM), exsiccat. Plants of Wyoming (as *Grimmia alpestris*).

This species has large areas of cells that are subsinuose, including the basal region. Most striking perhaps is the broad base of the awn confluent with the upper lamina.

CRATONEURON (Sull.) Spruce, Cat. Musc., 21. 1867. (Amblystegiaceae)

One must find the filamentous paraphyllia on the stem or one will probably think one is looking at a *Drepanocladus* (whose paraphyllia, when seen, are oriented to the leaf bases, not scattered generally over the stem). Illustrations of this genus tend to emphasize the deltoid forms, but *c. commutatum* looks more often than not exactly like a *Drepanocladus*, with thick walled basal/alar cells. It has long leaf cells and can be subentire except perhaps at the base and tip of the leaf. Also, in *Cratoneuron (commutatum)* the stem is thick and wiry, noticeable when attempting to strip leaves off—the leaves like as not will shred themselves. *Drepanocladus* stems are softer and the leaves do not disintegrate so readily.

[*Cratoneuron commutatum* (Hedw.) Roth = *Palustriella commutata* (Brid.) Ochyra, q.v.; excluded]

Cratoneuron falcatum (Brid.) G. Roth = *Palustriella falcata* (Brid.) Hedenäs

Cratoneuron filicinum (Hedw.) Spruce, Cat. Musc., 21. 1867.

Hypnum filicinum Hedw., Sp. Musc. Frond., 285, plate 76, figs. 5–10. 1801.

Amblystegium tenax var. *spinifolium* (Schimper) H.A. Crum & L.E. Anderson

Cratoneuron filicinum var. *aciculinum* (Müll. Hal. & Kindb.) Grout

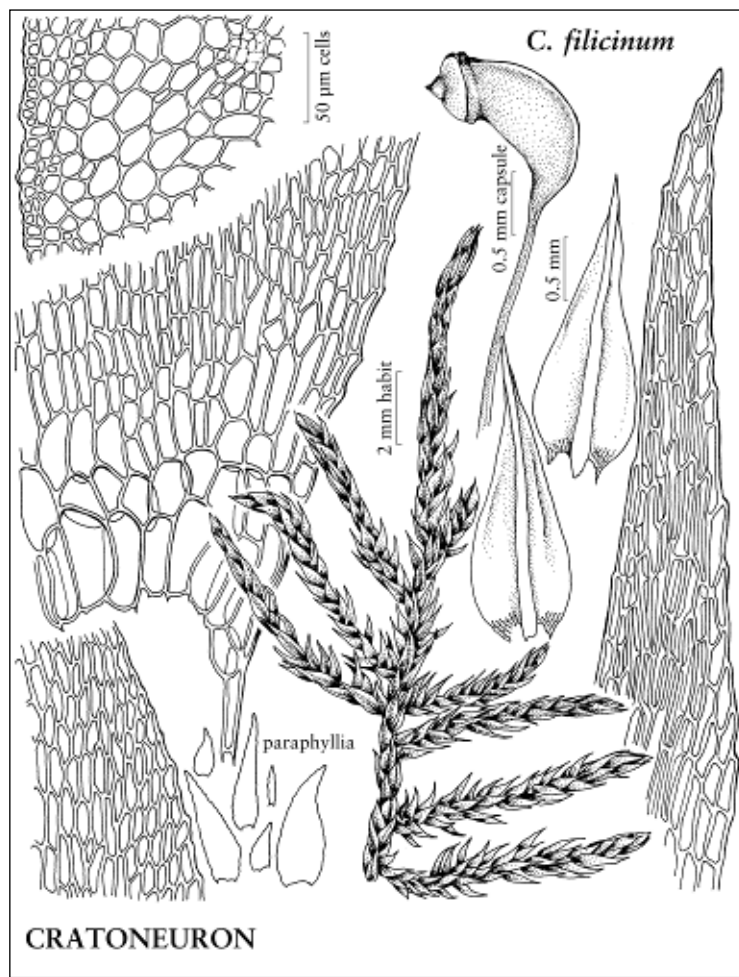
Cratoneuron curvicaule (Jur.) G. Roth

Cratoneuron filicinum var. *curvicaule* (Jur.) Mönk.

Wyoming (FNA Vol. 28, 2014). (As *Hypnum filicinum*) Wyoming: Yellowstone Natl Park (1566a, 1850) (Roell 1893). Albany County, Carbon County, Crook County, Sublette County, and Yellowstone Natl Park, Porter (1935). Albany, Crook, Sublette cos., Yellowstone Natl Park, Porter (1937). Teton Co., Spence (1985). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: NW base of Sheep Mtn., along WY 11, ca. 4 air mi ESE of Centennial, seep area (calcareous fen) with *Populus*, *Betula*, and *Salix*, Buck 23231 (NY). Carbon Co.: Ferris Mts., in a packet at US of *Bryum turbinatum*, 25 Jul 1898, Nelson 4978 (RM). Crook Co.: Nelson 1896 (RM). Lincoln Co.: 6400 ft, Hermann 25589 (RM). Natrona Co.: S of I-25, WY 252. Rotary Club Park in N-slope foothills, creek ravine, *Salix*, *Ribes*, *Alnus*, granite, with *Campyllum chrysophyllum*, 7 Jul 1985, Eckel 94100401 (BUF). 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 1720 (BUF). Teton Co.: 7000 ft, Hermann 25563 (RM); on US 26 & US 237, 1.3 mi W of Togwotee Pass, Bridger-Teton Natl. Forest, *Picea-Pinus flexilis* woodland, xeric but for stream bottoms, *Lupinulus*, *Asters*, wooded stream, soggy debris, ca. 9000 ft, 6 Jul 1985, Eckel 94082105 (BUF).

Care must be taken that this species is not confused with *Drepanocladus aduncus* forms such as var. *kneiffii*, which has long leaf cells and a channeled acumen in some forms and no serrations on the margin.



Courtesy FNA Association, FNA 28, 2014

CYNODONTIUM P. Bruch & Schimp. in W.P. Schimper, Coroll. Bryol. Eur., 12. 1856, name conserved. (Dicranaceae)

Cnestrum I. Hagen

[*Cynodontium alpestre* (Wahlenberg) Milde, Bryol. Siles., 51. 1869. [not present in Wyoming]

Dicranum alpestre Wahlenberg, Fl. Lapp., 339, fig. 21. 1812.

Cnestrum alpestre (Wahlenberg) Nyholm

Cynodontium subalpestre Kindb. in Macoun

Cynodontium tenellum (B.S.G.) Limpr.

Cynodontium torquescens Limpr.

Dicranum gracilescens var. *tenellum* B.S.G.

Oncophorus tenellus (B.S.G.) R.S. Williams



Courtesy FNA Association, FNA 28, 2014

Not yet reported for Wyoming (FNA Vol. 27, 2007), but should be expected. British Columbia, Alberta, Montana, Wyoming, Alaska, Northwest Territory; Saskatchewan, Manitoba, Ontario, South Dakota, Minnesota, Michigan; Greenland, Labrador, Nova Scotia, Quebec, New England, New York.

Cynodontium jeneri (Schimper) Stirton, Ann. Scott. Nat. Hist. 15(58): 106. 1906.
Didymodon jeneri Schimper, Trans. Bot. Soc. Edinburgh 9: 314, fig. 5. 1886.
Cynodontium polycarpum var. *laxirete* (Schimper) Stirton
 Wyoming (FNA Vol. 27, 2007).

Cynodontium polycarpon (Hedw.) Schimp., Coroll. Bryol. Eur., 12. 1856.
Fissidens polycarpus Hedw., Sp. Musc. Frond., 159. 1801.
Oncophorus polycarpus (Hedw.) Brid.
 Wyoming (FNA Vol. 27, 2007).

(As *Cynodontium polycarpum* (Ehrh.) Schimp.): Wyoming: Yellowstone Natl Park. 7000' (1439 p.p., 1440 p.p.). Hab.: Felsen." (Roell 1893). (As *Oncophorus polycarpus* (Hedw.) Brid.) Mammoth and Yellowstone Canyon, Yellowstone Natl Park (*R.S. Williams*), Porter (1935). (As *Oncophorus polycarpus* (Hedw.) Brid.) Yellowstone Natl Park, Porter (1937). Excluded from the flora of North America by Crum et al. (1973).

Cynodontium schisti (Web. & Mohr) Lindb., Öfvers. Kongl. Vetensk.-Akad. Förh. 21: 230. 1864.
Grimmia schisti Web. & Mohr, Index Mus. Pl. Crypt., (2). 1803.
Cnestrum schisti (Wahlenberg) I. Hagen
Cynodontiella schisti (Web. & Mohr) Bryhn
Grimmia schisti Web. & Mohr
Oncophorus brevipes Lindb.
Oncophorus schisti (Web. & Mohr) Lindb.
Rhabdoweisia schisti (Web. & Mohr) B.S.G.
Weissia schisti (Web. & Mohr) Brid.

Wyoming (FNA Vol. 27, 2007). British Columbia, Alberta, Montana, Wyoming; Alaska, South Dakota, Michigan, Ontario; Quebec (FNA). (As *Oncophorus schisti*) Albany Co., Porter (1937).

- Desmatodon cernuus (Hüb.) P. Bruch & Schimp. in B.S.G. = Tortula cernua (Hüb.) Lindb.
- Desmatodon guepinii P. Bruch & Schimp. in B.S.G. = Tortula guepinii P. Bruch & Schimp.
- Desmatodon heimii (Hedw.) Mitt. = Hennediella heimii (Hedw.) R.H. Zander
- Desmatodon latifolius (Hedw.) Brid. = Tortula hoppeana (Schultz) Ochyra
- Desmatodon leucostoma (R.Br.) Berggr. = Tortula leucostoma (R. Brown) Hook. & Grev.
- Desmatodon obtusifolius (Schwägr.) Schimp. = Tortula obtusifolia (Schwägr.) Mathieu
- Desmatodon plinthobius Sull. & Lesq. in Sull. = Tortula plinthobia (Sull. & Lesq.) Broth. in H. G. .
Engler and K. Prantl
- Desmatodon porteri (James) in C.F. Aust. = Tortula porteri (James) Broth. in H.G. Engler and K.
Prantl
- Desmatodon systylius Schimp. = Tortula systylia (Schimp.) Lindb.

DICHELYMA Myrin, Kongl. Vetensk. Acad. Handl. 1832: 273, plates 6, 7. 1833. (Fontinalaceae)

Dichelyma falcatum (Hedw.) Myrin, Kongl. Vetensk. Acad. Handl. 1832: 274. 1833.
Fontinalis falcata Hedw., Sp. Musc. Frond., 299. 1801.

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

Park Co.: 2900 m, *Weber B-44282* (RM, COLO).

Dichelyma uncinatum Mitt., J. Linn. Soc., Bot. 8: 44, plate 8 (upper left). 1864.
Dichelyma cylindricarpum Aust.
Dichelyma falcatum var. *uncinatum* (Mitt.) Lawton
Dichelyma uncinatum var. *cylindricarpum* (Austin) Card.

Wyoming (FNA Vol. 28, 2014). Wyoming: Yellowstone Natl Park (Roell 1893).

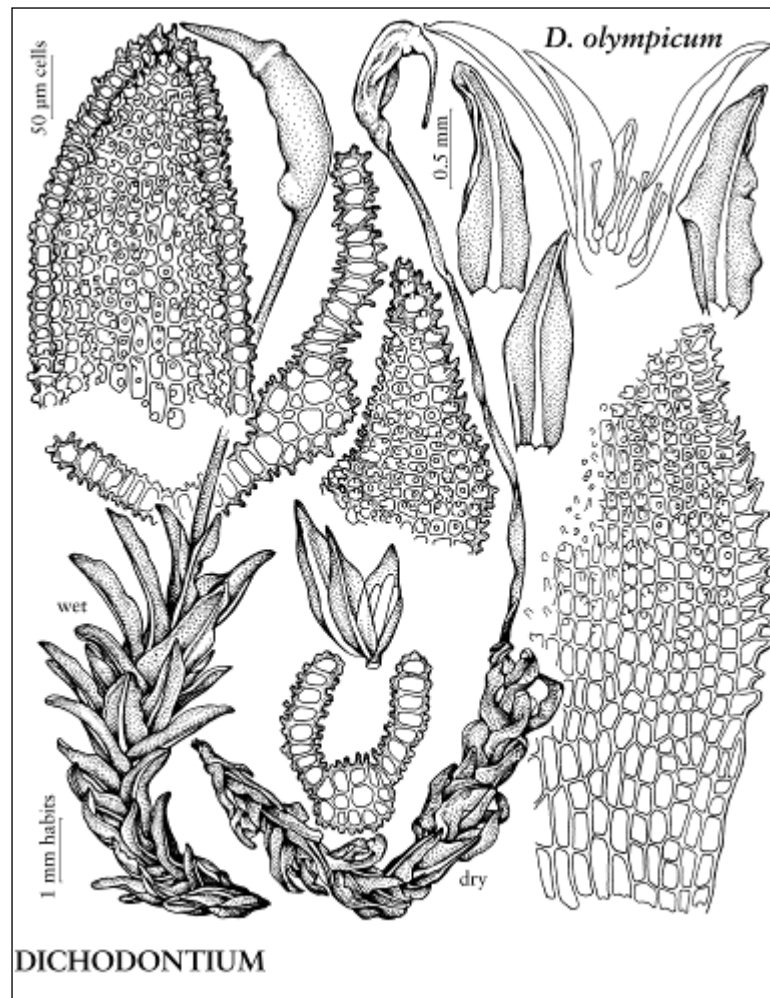
Yellowstone Natl Park: (Lost Lake near Roosevelt Lodge, with *Calliergonella conardii*
Lawt., 28 Aug 1951, *Lawton 1495* (WTU).

DICHODONTIUM Schimp., Coroll. Bryol. Eur., 12. 1856. (Dicranaceae)

Dichodontium olympicum Ren. & Card., Bot. Gaz. 17: 296. 1892.

Not reported for Wyoming in FNA (FNA Vol. 27, 2007). Brooklyn Lake, Albany County (Nelson 5178), Porter (1935).

Albany Co: La Plata Mines, 25 Aug 1898, Nelson 5178 (RM).



Courtesy FNA Association, FNA 27, 2007

Dichodontium pellucidum (Hedw.) Schimp., Coroll. Bryol. Eur., 12. 1856.

Dicranum pellucidum Hedw., Sp. Musc. Frond., 142. 1801.

Bryum flavescens Dickson ex Withering

Dichodontium flavescens (Dickson ex Withering) Lindb.

Dichodontium pellucidum var. *americanum* Lesq. & James

Dichodontium pellucidum var. *fagimontanum* (Brid.) Schimp.

Dichodontium subflavescens Kindb.

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

Albany Co.: 9800 ft, c.fr., 1 Sep 1970, *Hermann 23423* (RM); Medicine Bow Mountains, Barber Lake Picnic area, 2.5 air mi NW of Centennial, along Libby Creek, 8720–8740 ft, *Pinus contorta* forest, on rock streamside, 7 Jun 1993, *Miller 10,261B* (NYS) plus *Brachythecium nelsonii*.



Courtesy FNA Association, FNA 27, 2007

DICRANELLA (Müll. Hal.) Schimp., Coroll. Bryol. Eur., 13. 1856, name conserved. (Dicranaceae)

Dicranella crispa (Hedw.) Schimp., Coroll. Bryol. Eur., 13. 1856.

Dicranum crispum Hedw., Sp. Musc. Frond., 132. 1801.

Anisothecium crispum (Hedw.) Lindb.

Anisothecium vaginale (Withering) Loeske

Bryum vaginale Dicks.

Wyoming (FNA Vol. 27, 2007).

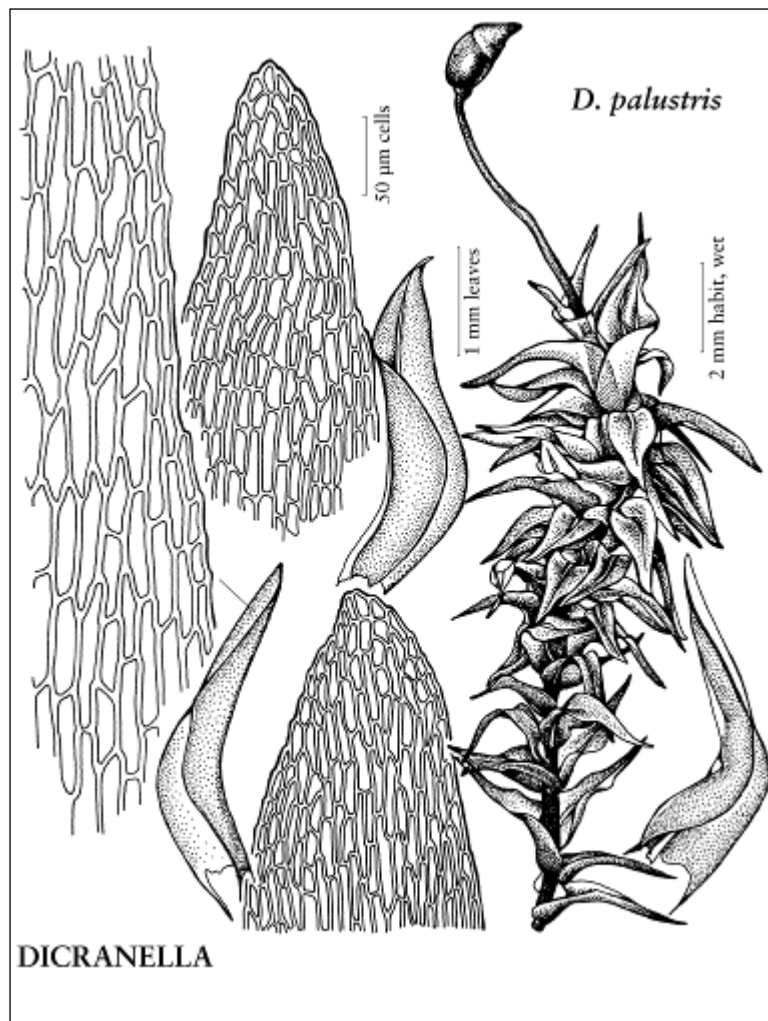
Dicranella palustris (Dickson) E.F. Warburg, Trans. Brit. Bryol. Soc. 4(2): 247. 1962.

Bryum palustre Dickson, Fasc. Pl. Crypt. Brit. 4: 11. 1801.

Dicranella squarrosa (Schrader) Schimp.

Not yet reported for Wyoming in FNA Vol. 27, 2007. "I collected new in the Rocky Mountains *Dicranum palustre* La Pyl. var. *schlotthaueri* Barn. in Yellowstone Natl Park, Wyom. ..." (Roell 1893).

Park Co. Beartooth Plateau, Shoshone Natl Forest, Forest Road 130 1A, Gilbert Creek, roadside, *Carex* spp.—Bryidae fen and moist meadow along creek bank, on damp clayey soil in seepage, T57N R108W S1, 44°57.380–385' N, 109°44.280–285' W, 2350 m, 31 Jul 2010, Kosovich-Anderson 7591 (RM, US, det. R. Ireland), same 7593 (RM, det. by the author) (see also Kosovich-Anderson 2011b).



Courtesy FNA Association, FNA 27, 2007

Dicranella schreberiana (Hedw.) Hilfert ex H.A. Crum & L.E. Anderson, Mosses E. N. Amer. 1: 169. 1981.

Dicranum schreberianum Hedw., Sp. Musc. Frond., 144, plate 33, figs. 6–10. 1801.

Anisothecium grevillianum (Brid.) Arnell & C.E.O. Jensen

Anisothecium schreberianum var. *elatum* (Schimp.) Wijk & Margadant
Anisothecium. schreberianum (Hedw.) Dixon
Cynodontium canadense Mitt.
Dichodontium canadense (Mitt.) Lesq. & James
Dicranella schreberi (Sw. ex Anonymous) Schimp.
Dicranella schreberi var. *occidentalis* Aust.
Dicranella canadense (Mitt.) Aust.
Dicranella grevilliana (Brid.) Schimp.
Dicranella schreberi var. *elata* Schimp.
Dicranella schreberi var. *elata* Schimp.
Dicranella schreberi var. *grevilliana* (Brid.) Mönk.
Dicranella schreberi var. *lenta* (Braithw.) Limpr.
Dicranella schreberi var. *robusta* Braithwaite
Dicranella schreberiana var. *robusta* (Braithwaite) H.A. Crum & L.E. Anderson
Leptotrichum canadense (Mitt.) A. Jaeger

Wyoming (FNA Vol. 27, 2007). British Columbia, Washington, Oregon, Alberta, Montana; Alaska; South Dakota, Michigan, Ontario; Labrador, Quebec, New York, Ohio, Pennsylvania, New Jersey.

Albany Co.: Steep, peaty bank of Friend Creek in willow thicket, 7800 ft, NW base of Laramie Peak 19 mi SSW of Esterbrook, 25 Sep 1974, *Hermann 25928* (RM); Medicine Bow Natl Forest, 26 mi SE of Laramie, moist peaty bank of Crow Creek in clearing, 8000 ft, 5 Jul 1974, *Hermann 25702*, c.fr. (RM). Johnson Co.: UTM 13 334577 E 4889076 N, on soil, in edge of stream, with grasses, sedges, *Salix* sp., surrounded by forest of *Pinus contorta* & *Picea engelmannii*, near head of North Fork Powder River, ca. 1 air mi SE of Powder River Pass, Bighorn Natl Forest, 2794 m, 31 Aug 2005, *Lenz 2426* (RM).

All four species in *Dicranella* from Wyoming have red (not yellow) setae, especially when old. The Lenz specimen represents the var. *robusta* (Schimp. ex Braithw.) Crum & Anderson, with blunt leaves, with “margins bluntly and irregularly serrulate to serrate with coarse teeth form by projections of marginal cells” (Crum & Anderson 1981). The cells are larger, the leaf bases are gradually tapered from the shoulders above the clasping base to the apex. The strong serrations develop from the apex to the base.

The leaves of *Dicranella schreberiana* are strongly crisped, wet or dry. *Dicranella schreberiana* is separated from *D. crispa* by the unistratose leaves (bistratose in parts). *Dicranella crispa* is bistratose in both margins and lamina in the distal part of the leaf. All four Wyoming species have leaves weakly to strongly squarrose on the stem, linear in the spreading upper part (the limb) from an enlarged, more or less erect, clasping or sheathing base. Other species in the genus have erect leaves from a spreading base. Both *D. schreberiana* and *D. palustris* have cells on the shoulders that are nearly isodiametric to short-rectangular (2–3:1), especially on the margins, but the leaves on *D. palustris* are long-decurrent with a blunt apex. They are not excurrent at all in *D. schreberiana* with an acute apex.

All the cells of species of *Onchophorus* are small and quadrate to short-rectangular, with no elongate, narrow rectangular cells. *Dichodontium* and *Cynodontium* have coarse mammillae or papillae on the leaves. Species of *Dicranum* have colored cells at the leaf base, especially in the alar region.

Dicranella subulata (Hedw.) Schimp., Coroll. Bryol. Eur., 13. 1856.

Dicranum subulatum Hedw., Sp. Musc. Frond., 128, figs. 1–5. 1801.

Dicranella curvata (Hedw.) Schimp.

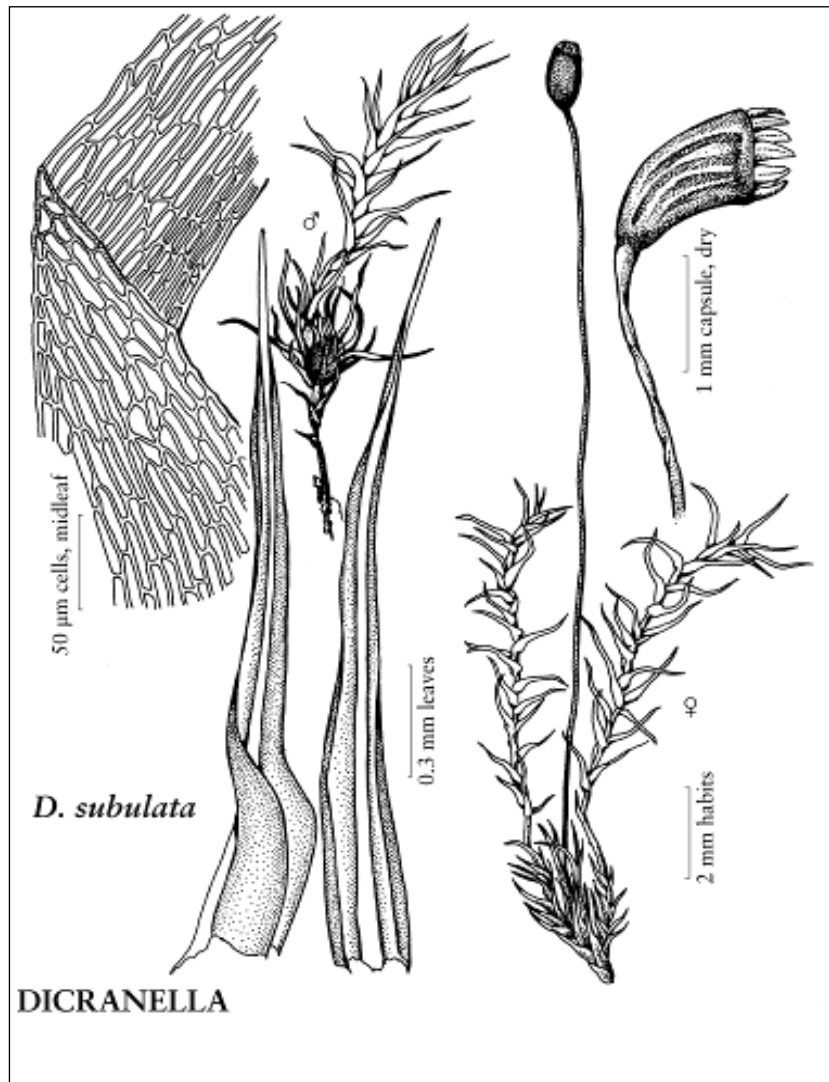
Dicranella secunda Lindb.

Dicranella stikinensis Grout

Dicranella subulata var. *curvata* (Hedw.) Rabenhorst

Wyoming (FNA Vol. 27, 2007). British Columbia, Washington, Alberta, Idaho, Montana, Wyoming; Alaska, Yukon, California; Greenland, Labrador, New Brunswick, Quebec, New England, Ireland (1982). (As *Dicranella curvata* Schimp.) Porter (1935), reported for Yellowstone Canyon, Yellowstone Natl Park.

Albany Co.: Lewis Lake, 10,800 ft, *Hermann 17715 1/2* (RM). Carbon Co.: North French Creek, Medicine Bow Mts., 9500 ft, *Hermann 17204* (RM). Yellowstone Natl Park: in slough, left of the first bridge, Uncle Tom's Trail, 1 Aug 1932, *Smiley 165* (YELLO), fruit just immature, calyptrate.



Courtesy FNA Association, FNA 27, 2007

DICRANOWEISIA Lindb. ex Milde, Bryol. Siles., 48. 1869. (Dicranaceae)

Dicranoweisia cirrata (Hedw.) Lindb. in C. Milde, Bryol. Siles., 49. 1869.

Weissia cirrata Hedw., Sp. Musc. Frond., 69. 1801.

Not reported for Wyoming in FNA (FNA Vol. 27, 2007). “Wyoming: Yellowstone Natl Park, 7000 ft (1439 p.p., 1440 p.p.) ... auf Holz, an Baumzweigen und an Felsen” (Roell 1893). Albany, Bighorn, Sublette, Teton cos., Yellowstone Natl Park, Porter (1935). Teton Co., Spence (1985).

Yellowstone Natl Park: Holz. examined, *Nelson & Nelson 5892* (RM).

Dicranoweisia crispula (Hedw.) Milde, Bryol. Siles., 49. 1869.

Weissia crispula Hedw., Sp. Musc. Frond., 68. 1801.

Dicranoweisia contermina Ren. & Card.

Dicranoweisia crispula var. *compacta* (Schwägr.) Lindb.

Dicranoweisia crispula var. *contermina* (Ren. & Card.) Grout

Dicranoweisia crispula var. *roellii* (Kindb. in Roell.) Lawt

Dicranoweisia roellii Kindb.

Trichostomum alpinum Kindb.

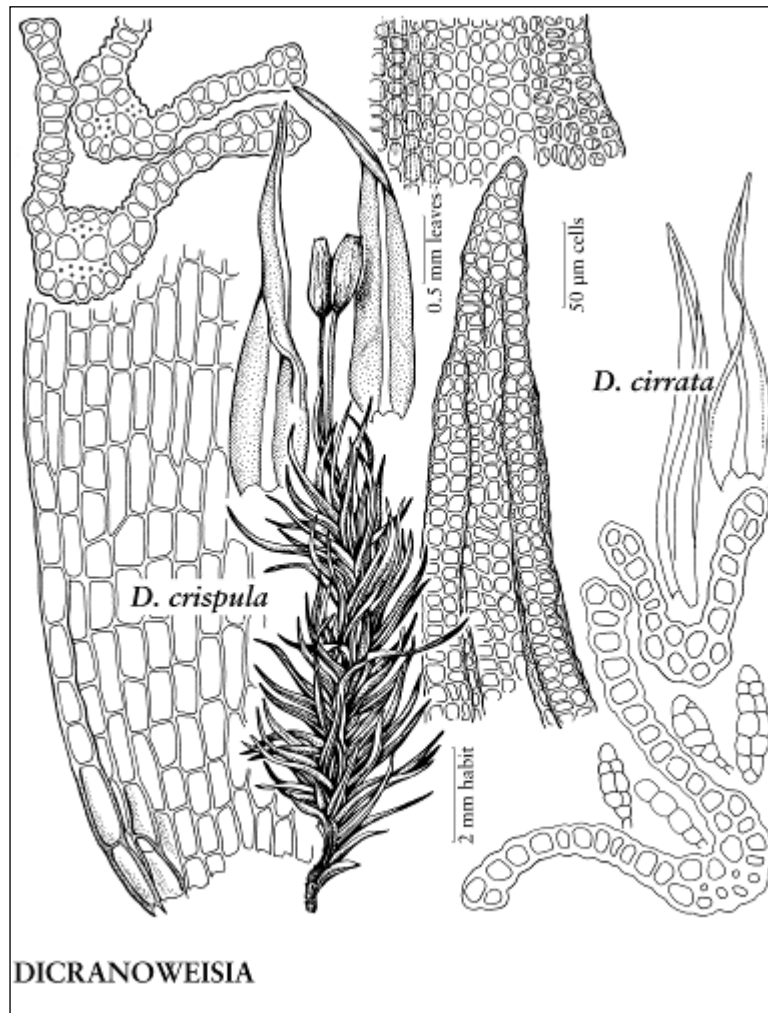
Weissia compacta Schwägr.

Weissia convoluta Müll. Hal. & Kindb. in Macoun

Wyoming (FNA Vol. 27, 2007). Throughout the Pacific Northwest; Alaska, Yukon, California, Nevada, Utah, Colorado: Michigan. Sheep Mountain, Albany Co (*Nelson 3312*); Tower Falls, Yellowstone Natl Park (Bartram and Williams, Porter (1935). “Common in front of glaciers”, Teton Range, Grand Teton Natl Park, Wyoming (Spence 1981). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

(As var. *crispula*): Albany Co.: granite boulder on aspen slope along N Fork of Little Laramie River, Sand Lake Rd., 8500 ft, Medicine Bow Mts., 3 mi W of Centennial, 4 Aug 1962, *Herman 17743*, c.fr., (RM); Medicine Bow Mtns, Barber Lake Picnic area, 2.5 air mi NW of Centennial, along Libby Creek, 8720–8740 ft, *Pinus contorta* forest, growing from crevice of boulder, 7 Jun 1993, *Miller 10,255* (NYS). Park Co.: on rocks 2900 m, *Weber B-44232* (COLO, RM); 2900 m, *Weber B-44232* (COLO, RM). Big Horn Co.: Big Horn Natl. Forest, Lake Helen Quadrant, Cloud Peak Wilderness Area, 10,200 ft, 3 Aug 1992, *Zacharkevics s.n.* (BING). Fremont Co.: Bridger-Teton Natl Forest on US 26 & US 287, between Moran & Dubois, ca. 9000 ft, alpine meadow, much herbage, wet with flowing streams, W slopes of knoll, *Eckel 9308103*, c.fr. (BUF); near border with Teton Co., between Moran and Dubois twps., on US 26, E of Togwotee pass, ca. 9000 ft at 63.0; S-facing, spruce and 2- & 5-needle pines, herbaceous, not species-abundant slope, *Artemisia tridentata* here and there, on granite, with *Brachythecium collinum*, 6 Jul 1985, *Eckel s.n.* (MO). Park Co.: granite bluff along Route 212, Shoshone Natl. Forest, 7500 ft, 47 mi NW of Cody, 19 Jul 1965, *Herman 20050* (RM). Sheridan Co.: limestone boulder in spruce-fir forest, Big Horn Natl Forest, T57N, R89W, Sect. 34, 19 Jun 1992, *McKee 92-F4* (RM) c.fr., with *Hypnum cupressiforme*, *Tortella tortuosa*, *Tortula norvegica*. (var. *contermina*). Sublette Co.: 7950 ft, *Hermann 25320* (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 7837* (BING). Teton Co.: Crystal Creek, on downed, decaying lodgepole pine, common, 7 Jul 1977, *Lichvar 677*, c.fr. (RM); 2250 m, wet rock, *Duell 2257/2* (BUF); perichaetial bracts mucous, blunt, basal cells more or less enlarged, brown-tinged, boulder on open slope along Hidden Falls Trail, NW of Jenny Lake, 7000 ft, Teton Range, Natl Park, 29 Aug 1973, *Hermann 25554*, fruit in spears (RM). Yellowstone Natl Park: on US 14, 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, c.fr., 6 Jul 1985, *Eckel 94082302* (BUF, RM); on stump,

in Clematis Gulch opposite the reservoir, 29 Jul 1932, *Smiley 46*, c.fr., dehisced (det. as *Weisia wolfii*) (YELLO); on large boulder in shade, Old Faithful, Observation Point Trail, 1 Aug 1932, *Smiley 93* (YELLO), fruit in spears (as *Weisia wolfii*); on boulder, Old Faithful, Observation Point Trail, 1 Aug 1932, *Smiley 159* (YELLO) (as *Weissia convoluta*).



Courtesy FNA Association, FNA 27, 2007

The dried capsules, though not longitudinally striate as in *Cynodontium*, are irregularly so (rugose) with rugae “squirring” on the capsule surface. Note also how like *Ceratodon purpureus* the leaves are, with their deeper channeling, toothed or stepped apical margins and box-like cells (square). The double layer of cells is distinctive. Occasionally the characteristic longitudinal striations are quite visible in cells just above the basal cells; they may be high enough to be discerned by the shallow depth of field under high magnification (x570). If the striae are not very high, a cross Sect. is necessary. The leaves of this species are not recurved but appear to be that way because of the double to triple cell layers at the extreme margins—a Sect. is definitive.

In the variety *crispula*, the inner perichaetial leaves are convolute-sheathing, with no limb, obtuse to acute. In the var. *contermina*, there is a limb in the inner perichaetial leaves, the perichaetial leaves tend to be acuminate.

Europeans and Crum and Anderson (1981) did not refer to a var. *contermina*. The inflated basal cells of the typical variety are not demonstrated in this variety, or only occasionally. Perhaps specimens in the western United States lose the distinction of this characteristic. However, the perichaetial leaves do not correlate: convolute leaves with no limb or awn may be found with leaves with no inflated alar cells. According to Flowers (1973) “Since most of our plants have undifferentiated alar cells associated with acute to broadly obtuse convolute-clasping inner perichaetial leaves, var. *contermina* loses much of its supposed individuality and rests only on the clasping but scarcely convolute inner perichaetial leaves with rather long acuminate upper portions.”

DICRANUM Hedw., Sp. Musc. Frond., 126. 1801. (Dicranaceae)

Dicranum acutifolium (Lindb. & Arnell) C.E.O. Jensen in H. Weimarck, Förtekn. Skand. Växt., Moss. ed. 2 18. 1937.

Dicranum bergeri var. *acutifolium* Lindb. & Arnell, Kongl. Svenska Vetensk. Acad. Handl., n. s. 23(10): 79. 1890.

Wyoming (FNA Vol. 27, 2007). “(Leaf) margins ... are almost completely 2-stratose” (Ireland, FNA Vol. 27, 2007).

Dicranum bonjeanii De Not. in D. Lisa, Elenc. Musch., 29. 1837.

Wyoming (FNA Vol. 27, 2007). (With *Dicranum palustre* La Pyl. as synonym:) Wyoming: Yellowstone Natl Park (1443). (Roell 1893). Roell had particular difficulty distinguishing his *D. bonjeanii* from *D. scoparium*, “Approximately half of this material (1443) appears typical enough. The rest is similar to those from Seattle (166)” (Roell 1893). Roell described a new variety of *D. bonjeanii*, var. *schlotthaueri* from Yellowstone, 7000 ft (1441).

Usually synonymized with *Dicranum scoparium* (Ireland, FNA Vol. 27, 2007), but recognized by many as distinct. “...both species are distinctive ecologically: *D. bonjeanii* prefers eutrophic fens, whereas *D. scoparium* usually grows in decidedly dry to mesic woodlands, on soil, humus, humus over rock, stumps and logs, tree bases, etc.” (Ireland, FNA Vol. 27, 2007).

Dicranum elongatum Schwägr., Sp. Musc. Frond. Suppl. 1(1): 171, plate 43. 1811.

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

Park Co.: SNF, Beartooth Plateau, 0.8 km E of Christmas Lake, head of an unnamed tributary to Litterlock Creek, alpine fen, north-central portion of fen, *Salix planifolia*—*Carex scopulorum*, abundant in hummocks, on peaty soil, T58N, R104W, S34, 44°57,930–58,015’N, 109°24,820–850’W, 3245 m, 21 Aug 2008, *Kosovich-Anderson 3593* (COLO, MO, RM), also *3611, 3624, 3640, 3664, 3676* (Kosovich-Anderson 2011a).

Dicranum fuscescens Turner, Muscol. Hibern. Spic., 60, plate 5, fig. 1. 1804.

Var. **fuscescens**

Dicranum camptophyllum Kindb.

Dicranum congestum Brid.

Dicranum crispulum Müll. Hal. & Kindb. in Macoun

Dicranum fuscescens var. *congestum* (Brid.) Husnot

Dicranum leucobasis Müll. Hal. & Kindb. in Macoun

Dicranum sulcatum Kindb. in Macoun

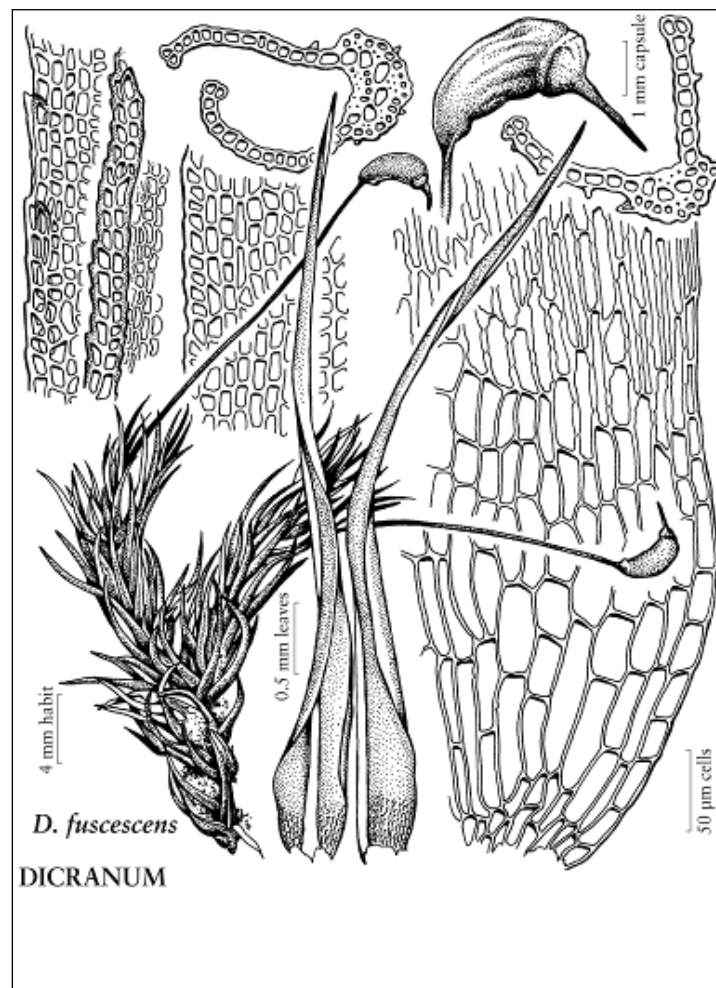
Dicranum sulcatum Kindb.

Dicranum trachyphyllum Ren. & Card.

Wyoming (FNA Vol. 27, 2007). Throughout the Pacific Northwest; Alaska, Yukon, California, Colorado; Minnesota, Michigan, Ontario; Greenland and Labrador to Florida.

Yellowstone Natl Park: Clematis Gulch Trail, 16Aug 1953, *Lawton 1799* (YELLO).

Distinct from *D. acutifolium* by leaf margins that are mostly 1-stratose (Ireland, FNA Vol. 27, 2007). There is a var. *flexicaule* (Brid.) Wils. in the 1990 checklist.



Courtesy FNA Association, FNA 27, 2007

Dicranum muehlenbeckii P. Bruch & Schimp., Bryol. Europ. 1: 142, plate 78. 1847.

Dicranum rauei Aust.

Wyoming (FNA Vol. 27, 2007). Wyoming: Yellowstone Natl Park, 7000 ft(1444, 1445 p.p.), “these specimens are sterile and are perhaps to be compared with *Drcranum fuscescens*” (Roell 1893). (Rare) British Columbia, Alberta, Montana, Wyoming; Alaska, Northwest Territory, Colorado; North Dakota, Ontario; Quebec, New England. Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

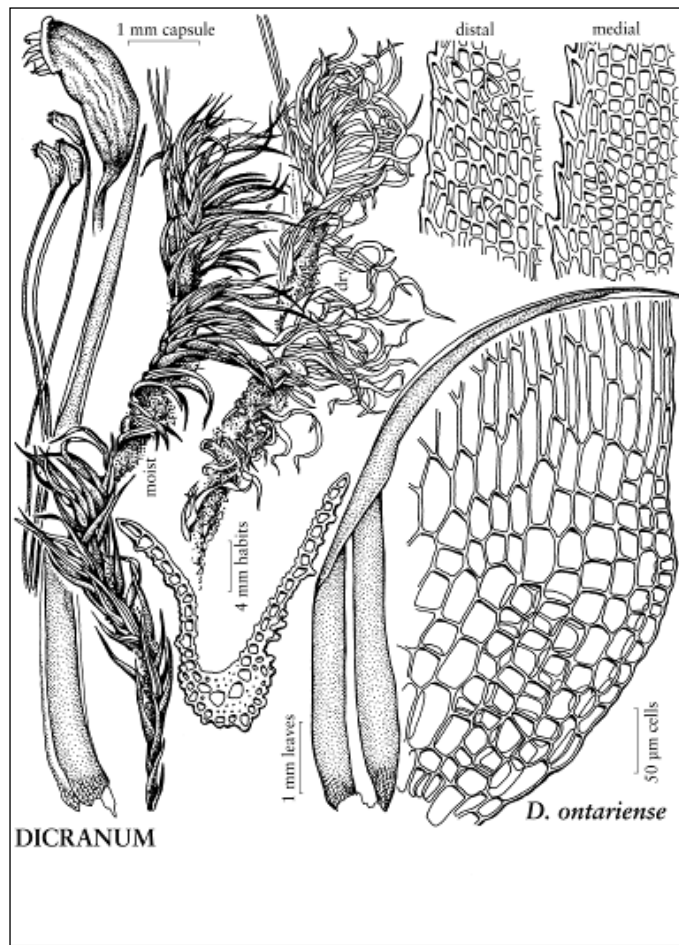
Park Co.: Beartooth Pass, 3200 m, *Weber B-44303* (COLO, RM); hummock in white spruce fen at base of Cathedral Cliff, 2 mi E of Crandall Ranger Station, 6600 ft, 12 Aug 1990, *Elliott 1742* (BUF).

“... a somewhat rare species throughout North America” (Ireland, FNA Vol. 27, 2007).

Dicranum ontariense W.L. Peterson, Canad. J. Bot. 55: 988. 1977.

Dicranum drummondii Sull. ex Lindb., Bot. Not. 1865: 79. 1865, not Müll. Hal. 1848.

Wyoming (FNA Vol. 27, 2007). “This is a North American endemic species that was previously mistaken for *D. drummondii* Müll. Hal., a predominantly Eurasian species which was unknown on this continent until it was discovered just recently on the Aleutian Islands” (Ireland, FNA Vol. 27, 2007).



Courtesy FNA Association, FNA 27, 2007

Dicranum polysetum Sw., Monthly Rev., ser. 2, 34: 538. 1801.*Bryum rugosum* Hoffm. ex Funck*Dicranum rugosum* (Funck) Hoffm. ex Brid.*Dicranum undulatum* Ehrh. ex Web. & Mohr

Wyoming (FNA Vol. 27, 2007). British Columbia, Washington, Alberta, Montana, Wyoming; Alaska; widespread in the Middle West, Manitoba to Michigan, south to South Dakota, Iowa, and Illinois; Newfoundland and Nova Scotia to North Carolina. Rare (As *D. rugosum*), Weston Co., Wynne (1943). Ireland (1982). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

“It is one of the largest, most conspicuous, and most easily recognized species in the genus in North America” (Ireland, FNA Vol. 27, 2007).

Dicranum rhabdocarpum Sull., Mem. Amer. Acad. Arts, n. s. 4: 172. 1849.*Dicranum scoparioides* Schimp. in Besch.*Orthodicranum rhabdocarpum* (Sulliv.) Holz.

Wyoming (FNA Vol. 27, 2007). Wyoming; Colorado, New Mexico, Arizona. Lawton. On the Colorado-Wyoming line, Albany County (Porter 1756). Teton Co., Spence (1985).

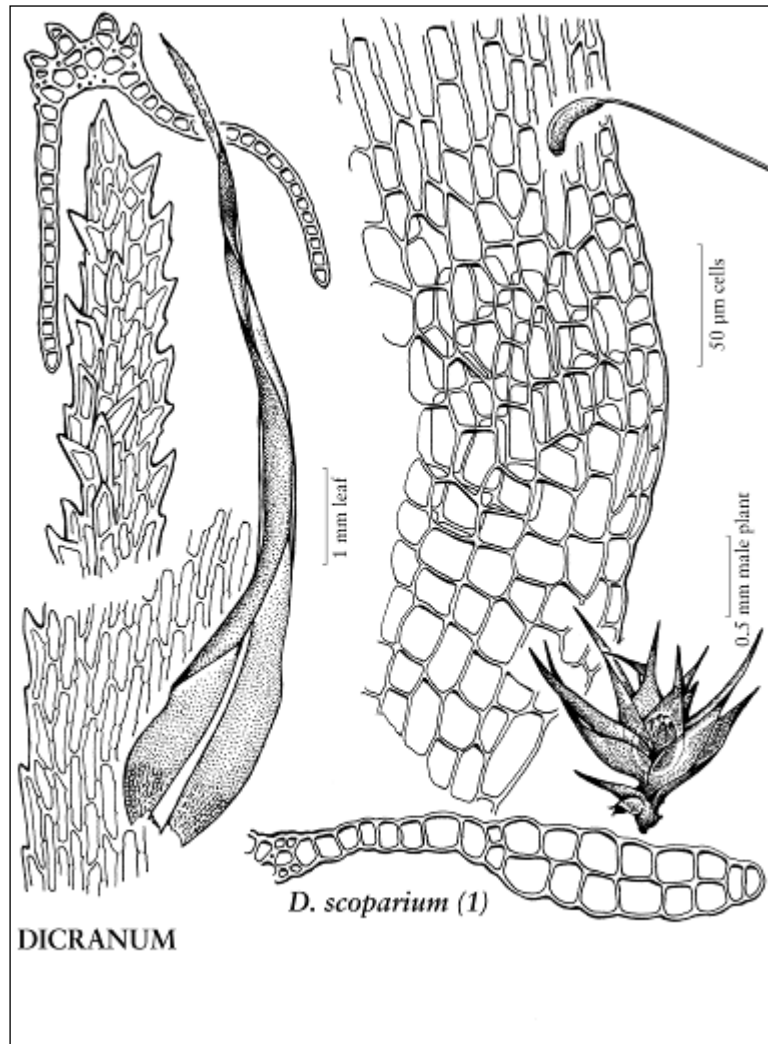
Yellowstone Natl Park: on the drier shaded ground near the lake shore, Beaver Lake, *Nelson & Nelson 6125* (RM); 24 Jul 1899, exsiccat, det. R. H. True. (Originally as *D. bonjeani*). Verified by R. Ireland, CANM 1991.

“... an easily recognized species that occurs in the flora area only in the Rocky Mountains and the mountains of Arizona” (Ireland, FNA Vol. 27, 2007).

Dicranum scoparium Hedw., Sp. Musc. Frond., 126. 1801.*Dicranum angustifolium* Kindb. in Macoun*Dicranum canadense* Kindb., in Macoun*Dicranum kindbergii* Par.*Dicranum latifolium* J.J. Amann*Dicranum mexicanum* Schimp. in Besch.*Dicranum pallidum* P. Bruch & Schimp. ex Müll. Hal.*Dicranum scopariforme* Kindb.

Wyoming: Yellowstone Natl Park, 7000 ft (1442). (Roell 1893). Throughout the Pacific Northwest; Alaska, Colorado; South Dakota, Minnesota, Iowa, Michigan, Ontario; Newfoundland, New Brunswick and Quebec to Georgia and Alabama. Albany, Teton cos., Porter (1937). Teton Co., Spence (1985). (As *Dicranum bonjeani* DeNot.) (Albany Co.), Beaver Lake, Yellowstone Natl Park (Nelson 5936), Porter (1937). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Sheridan Co.: mineral soil on limestone, Bighorn Natl Forest, T57N, R89W, Sect. 27, 16 Jun 1992, *McKee 92-025*, c.fr., dehisced, teeth uneroded, with *Ditrichum flexicaule* (BUF, RM.). Teton Co.: on humus in deep shade under shrubs along Jenny Lake Trail, W shore of Jenny Lake, 7000 ft, 5 Aug 1974, *Hermann 25766* (sterile) (RM). Yellowstone Natl Park: 7 Jul 1934, *Frye s.n.* (RM); open lodgepole pine woods, 8000 ft, 4 mi NW of Fishing Bridge, 18 Jul 1965, *Hermann 20020* (sterile) (RM); Firehole River, near Old Faithful Geyser, on soil, 6 Jul 1934, *Frye s.n.*, the leaves are well toothed, long and slender (RM); along Firehole River, Old Faithful, 4 Sep 1948, *Conard 48-262* (YELLOW).



Courtesy FNA Association, FNA 27, 2007

Dicranum spadiceum Zett., Kongl. Svenska Vetensk. Acad. Handl. 5(10): 20. 1865.

Dicranum angustum Lindb.

Dicranum laevidens R.S. Williams

Dicranum muehlenbeckii var. *neglectum* (De Not.) Pfeff.

Dicranum neglectum Jur. ex De Not.

Wyoming (FNA Vol. 27, 2007). Wyoming; Alaska, Yukon; Labrador, Quebec. Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010). (As *Dicranum neglectum* Juratz.) Yancey's, Yellowstone Natl Park (Nelson & Nelson 5936), Porter (1935). Wyoming, Flowers (1973).

Park Co.: Beartooth Plateau, 2900 m, *Weber B-44241* (COLO, RM). Yellowstone Natl Park: 17 Jul 1899, *Nelson & Nelson s.n.* (RM); Lost Lake, 17 Aug 1953, *Lawton 1833* (det. as *D. fuscescens*) (YELLO).

This species, in areolation, resembles a broader *Dicranum elongatum*.

Dicranum tauricum Sapjegin, Bot. Jahrb. Syst. 46: 10. 1911.

Dicranum strictum Schleich. ex D. Mohr, illeg.
Orthodicranum strictum (Mohr) Broth.

Wyoming (FNA Vol. 27, 2007). Throughout the Pacific Northwest; Alaska, California, Colorado, Saskatchewan. Wyoming, Flowers (1973). (As *Dicranum strictum* Schleich.) Tower Falls, Yellowstone Natl Park (collector unknown), Porter (1935). Campbell Co., Medina (1994). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Crook Co.: Black Hills: Bear Lodge Mts., along Beaver Creek, 6.4 km NNE of Warrens Peak, conifer woods; moss partly shaded, on decaying *Pinus ponderosa* log, *Churchill 8748* (BUF), Exsiccat 13 Musci Planitiebus Incolae 1987. Yellowstone Natl Park: Tower Junction, *Hermann 25768* (RM).

DIDYMODON Hedw., Sp. Musc. Frond., 104. 1801. (Pottiaceae)
Geheebia Schimp.
Trichostomopsis Card.

Didymodon asperifolius (Mitt.) H.A. Crum, Steere & L.E. Anderson, Bryologist 67: 163. 1964.
Barbula asperifolia Mitt., J. Proc. Linn. Soc., Bot., suppl. 1: 34. 1859.
Didymodon rufus Lorentz

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

Park Co.: 3250 m, *Weber B-44226* (RM, COLO)..

Didymodon fallax (Hedw.) R.H. Zander, Phytologia 41: 28. 1978.
Barbula fallax Hedw., Sp. Musc. Frond., 120. 1801.
Barbula ferruginea Schimp. ex Besch.
Triquetrella ferruginea (Schimp. ex Besch.) Thér.

Wyoming (FNA Vol. 27, 2007).

Sheridan Co.: Mineral soil on limestone outcrop, Big Horn Natl Forest, T57N, R89W, Sect. 28, with *Distichium capillaceum* and *Mnium blyttii*, 17 Jun 1992, *McKee 92-030* (RM).

Didymodon ferrugineus (Schimp. ex Besch.) M.O. Hill, J. Bryol. 11: 599. 1982.
Barbula ferruginea Schimp. ex Besch., Mém. Soc. Natl. Sci. Nat. Cherbourg 16: 181. 1872.
Barbula reflexa (Brid.) Brid.
Didymodon fallax var. *reflexus* (Brid.) R.H. Zander
Didymodon rigidicaulis (Müll. Hal.) K. Saito

Not reported for Wyoming in FNA (FNA Vol. 27, 2007).

(As *D. fallax* var. *reflexus* (Brid.) Zander) Crum & Anderson 1981: 342 mention a report from Wyoming.

[*Didymodon luridus* Sprengel, excluded]

(See Zander 1978) “does not occur in the flora area, though reported from there by many authors (often as *D. trifarius*, see Zander 1981” (Zander, FNA 2007). (As *Didymodon trifarius*) Weston Co., Wynne (1943).

Didymodon nicholsonii Culmann, Rev. Bryol. 34: 100, figs. 1–9. 1907 (as nicholsoni).
Didymodon vinealis var. *nicholsonii* (Culmann) R.H. Zander

Not reported for Wyoming FNA (FNA Vol. 27, 2007).

Park Co.: 6500 ft, *Hermann 20033* (RM).

Didymodon rigidulus Hedw., Sp. Musc. Frond., 104. 1801 (as rigidulum).
Barbula rigidula (Hedw.) Milde

Var. rigidulus

Barbula waghornei Kindb.
Didymodon fuscoviridis Card.

Wyoming (FNA Vol. 27, 2007). (As *Barbula rigidulus* (Hedw.) Mitt.) Limestone rocks, Telephone Canyon, Albany Co. (*Porter 1278*), Porter (1937). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Sheridan Co.: hanging underneath a ledge with dripping water from limestone seep, moist limestone, Big Horn Natl Forest, T57N, R89W, Sect. 34, 16 Jun 1992, *McKee 92-010*, with propagula, with *D. rigidulus* var. *icmadophilus* intermixed (BUF).

Var. gracilis (Schleicher ex Hook. & Grev.) R.H. Zander, Cryptog. Bryol. Lichénol. 2: 393. 1981.
Tortula gracilis Schleicher ex Hook. & Grev., Edinburgh J. Sci. 1: 300. 1824.
Barbula acuta (Brid.) Brid.
Didymodon acutus (Brid.) K. Saito

Wyoming (FNA Vol. 27, 2007).

Albany Co.: 7415 ft, limestone rock, full sunlight, 19 Mar 1988, *Vukelich s.n.* (BUF); forming dense cushions on limestone rocks, Telephone Canyon, 25 Nov 1932, *Porter 1278* (NY). Crooke Co.: *Eckel 219686* (RM, BUF). Fremont Co.: big spring about 4 mi east of Dubois, 23 Jun 1931, *Frye s.n.* (WTU). Sheridan Co.: in crevices of rock ridge faces, limestone, Big Horn Natl Forest, T57N, R89W Sect. 15, 24 Jun 1992, *McKee 92-048* (RM).

See also discussion sub var. *icmadophilus*.

Var. icmadophilus (Schimp. ex Müll. Hal.) R.H. Zander, Cryptog. Bryol. Lichénol. 2: 394. 1981.
Barbula icmadophila Schimp. ex Müll. Hal., Syn. Musc. Frond. 1: 614. 1849.
Barbula acuta ssp. *icmadophila* (Schimp. ex c. m) Podp.
Barbula acuta var. *icmadophila* (Schimp. ex Müll. Hal.) H.A. Crum;
Barbula gracilis ssp. *icmadophila* (Schimp. ex Müll. Hal.) Amann
Didymodon acutus var. *icmadophilus* (Schimp. ex Müll. Hal.) R.H. Zander
Didymodon icmadophilus (Schimp. ex Müll. Hal.) Saito (as “icmadophyllus”).
Tortula icmadophila (Schimp. ex Müll. Hal.) Lindb.

This variety was not reported for Wyoming by FNA (FNA Vol. 27, 2007).

Sheridan Co.: hanging underneath a ledge with dripping water from limestone seep, moist limestone, Big Horn Natl Forest, T57N, R89W, Sect. 34, Jun 16 1992, *McKee 92-010* (BUF), with *D. rigidulus* var. *rigidulus* (propaguliferous) intermixed.

The above specimen has the characteristic attenuated fleshy apices and reduced upper lamina. The varieties intergrade. Note that var. *icmadophilus* is generally longer in both leaf and acumen than *gracilis* (see Zander, Cryptogamie). A specimen from the Loess Hills of Iowa is also papillose.

Didymodon tophaceus (Brid.) Lisa, Elenc. Musch., 31. 1837.

Trichostomum tophaceum Brid., Muscol. Recent., suppl. 4: 84. 1818.

Barbula pringlei (Card.) Hilp.

Barbula tophacea (Brid.) Mitt.

Dactylhymenium pringlei Card.

Desmatodon hendersonii (Ren. & Card.) R S. Williams

Husnotiella pringlei (Card.) Grout

Wyoming (FNA Vol. 27, 2007).

Didymodon umbrosus (Müll. Hal.) R.H. Zander, Phytologia 41: 22. 1978.

Barbula umbrosa Müll. Hal., Linnaea 42: 340. 1879.

Didymodon australasiae var. *umbrosus* (Muller Hal.) R.H. Zander

Trichostomopsis crispifolia Card.

Trichostomopsis umbrosa (Müll. Hal.) H. Robinson

This species was not reported for Wyoming by FNA (FNA Vol. 27, 2007), although a duplicate of the following specimen existed at BUF indicated the author of the FNA treatment had verified it, even though the record did not end up in the FNA.

Sublette Co.: South Fork of Baldy Creek headwaters, 10,290 ft, on damp rock at edge of fen, 42°59'N, 109°34'W, 16 Aug 1989, *Andrus 7833a* (BING, BUF).

Didymodon vinealis (Brid.) R.H. Zander, Phytologia 41: 25. 1978.

Barbula vinealis Brid., Bryol. Univ. 1: 830. 1827.

Var. vinealis

Barbula bakeri Card. & Thériot

Barbula circinnulata Müll. Hal. & Kindb.

Barbula cylindrica (Taylor) Schimp.

Barbula. flexifolia Hampe

Barbula horridifolia Müll. Hal. & Kindb.

Barbula laterita Kindb.

Barbula pseudorigidula Müll. Hal. & Kindb.

Barbula robustifolia Müll. Hal. & Kindb.

Barbula semitorta Sull.

Barbula subcylindrica Broth.

Barbula subgracilis Müll. Hal. & Kindb.

Barbula tortellifolia Müll. Hal. & Kindb.

Barbula treleasei Card. & Thériot

Barbula vinealis var. *flaccida* P. Bruch & Schimp.

Barbula virescens Lesq.

Didymodon vinealis var. *flaccidus* (P. Bruch & Schimp.) R.H. Zander

Wyoming (FNA Vol. 27, 2007).

Sheridan Co. 6600–8000 ft, *Odasz 1145* (RM, BUF). Washakie Co.: Tensleep Canyon, willow roots, streamside, 24 Jul 1980, *Zander s.n.* (BUF). Weston Co.: dryish hill, on ground, with *Desmatodon obtusifolius*, *Bryoerythrophyllum recurvirostrum*, 16 Jul 1942, *Degener & Peiler s.n.* (NY). (as var. *flaccidus*). Sheridan Co.: on vertical rock face, moist limestone, Big Horn Natl Forest, T57N, R89W, Sect. 27, with *Homalothecium*, *Bryoerythrophyllum recurvirostrum*, *Fissidens bryoides*, *Platydictya jungermannioides*, *Distichium capillaceum*, *McKee 92–024* (BUF). Yellowstone Natl Park: shore of Yellowstone Lake near West Thumb, limestone, 23 Jul 1980, *Zander s.n.* (BUF).

Var. **rubiginosus** (Mitt.) R.H. Zander, *Cryptog. Bryol. Lichénol.* 2: 417. 1981.

Barbula rubiginosa Mitt., *J. Linn. Soc., Bot.* 8: 27, fig. 5. 1865.

Barbula melanocarpa Kindb.

Barbula subicmadophila Kindb.

Didymodon occidentalis R.H. Zander

Racomitrium cyclodictyon Card. & Thériot

Not reported for Wyoming by FNA (FNA Vol. 27, 2007), but no doubt overlooked at BUF.

Teton Co.: at Hwy. 22, Burbank Creek 6 mi SE of Victor, *Pinus-Pseudotsuga*-forests, primitive rocks about 2260 m on rock at creek border, *Duell 2238/2* (BUF).

DISTICHIUM P. Bruch & Schimp., *Bryol. Europ.* 2: 153. 1846. (Ditrichaceae)

Distichum capillaceum (Hedw.) P. Bruch & Schimp., *Bryol. Europ.* 2: 156. 1846.

Cynodontium capillaceum Hedw., *Sp. Musc. Frond.*, 57. 1801.

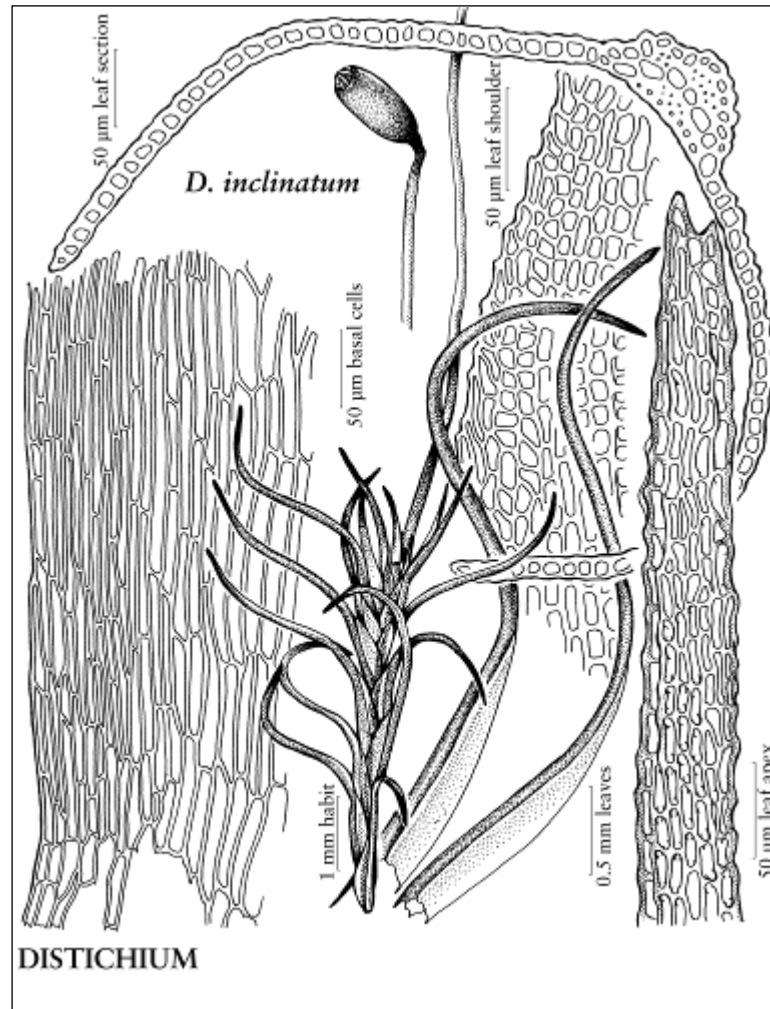
Swartzia montana Lindb.

Wyoming (FNA Vol. 27, 2007). Throughout the Pacific Northwest; Alaska, California, Nevada, Utah, Colorado, Arizona; Manitoba, Minnesota, Michigan; Greenland and Nova Scotia to New England and New York. (As *Swartzia montana*) Rather common throughout the State, especially in limestone regions. Albany, Carbon, Johnson, Sheridan, Sublette, Teton cos., Yellowstone Natl Park, Porter (1937). “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).

Albany Co.: Medicine Bow Mountains, W of Centennial, Pole Mountain Division (Sheridan Mountains), WY 130, near the Snowy Range Pass, granite rocks, partial shade, 5 Aug 1984, *Eckel 871107* (BUF). Big Horn Co.: T49N R 87W S25, Big Horn Mountains, ca. 1 air mi SW of Tyrrell Ranger Station, Sect. 25 & 36, E-facing slope, 8800 ft, 21 Jun 1979, *Hartman & Odasz 9146* (RM). Johnson Co.: 6600 ft, *B. Nelson 6836c* (RM). Park Co.: wet soil in white spruce fen at base of Cathedral Cliff, 2 mi E of Crandall Ranger Station, 6600 ft, 19 Apr 1992, *Elliott 1935* (BUF). Sheridan Co.: Big Horn Mtns., Ice Creek, ca. 8.5 air mi WNW of Burgess Junction, openings in valley and on slopes, 8800 ft, 23 Jun 1979, *Hartman & Odasz 9248* (RM). Sublette Co.: 10,348 ft, *Rolston 85115* (CSU). Teton Co.: on US 26 & US 237, 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, c.fr., 6 Jul 1985, *Eckel 94082101* (BUF, RM). Washakie Co.: 8000 ft, *Nelson & Fonken 7316* (RM, BUF). Yellowstone Natl Park: grassy seep, swale, roots of *Salix*, 6239 ft, a few miles from Mammoth Hot Springs on Road to Tower, with *Aulacomnium palustre*,

Amblystegium juratz., *Bryoerythrophyllum recurvirostrum*, *Bryum pseudotriquetrum* var. *bimum*, *Brachythecium frigidum*, *Drepanocladus aduncus*, *D. uncinatus*, *Leptobryum pyriforme*, *Plagiomnium rugicum*, *Plagiothecium denticulatum*, 6 Jul 1995, Eckel 95082828 (BUF),

Without fruit, this may be confused with *Leptobryum pyriforme*: both have long, setaceous leaves. There is a var. *curvatum* Flow. in 1990 checklist (= same capsule but curved—banana shaped.)



Courtesy FNA Association, FNA 27, 2007

Distichum inclinatum (Hedw.) P. Bruch & Schimp., *Bryol. Europ.* 2: 157. 1846.
Cynodontium inclinatum Hedw., *Sp. Musc. Frond.*, 58. 1801.
Swartzia inclinata Hedw.

Wyoming (FNA Vol. 27, 2007). Wyoming: Yellowstone Natl Park, (1447) (Roell 1893). British Columbia, Alberta, Montana, Wyoming; Yukon, Northwest Territory, California, Nevada, Utah, Colorado; Minnesota, Ontario; Greenland, Quebec, and New England. (As *Swartzia inclinata* Hedw.) Mammoth Hot Springs, Yellowstone Natl Park (*Nelson 6026*), Porter (1935). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: NW base of Sheep Mtn, along WY 11, ca. 4 air mi ESE of Centennial, seep area (calcareous fen) with *Populus*, *Betula* and *Salix* dominant, 7 Jun 1993, *Buck 23246*, c.fr., (NY).
Fremont Co.: *Hermann 25309* (RM).

Buck's specimen conforms well to Flower's (1973) description. As compared to its congener, the stems are indeed darker, as are the capsules, as though the plant was smudged; the capsules are inclined from the juncture with the seta and asymmetrical. The setae are red-purple at the base and red to red-orange above. The peristome segments are strikingly broad.

DITRICHUM Hampe, Flora 50: 181. 1867, name conserved. (Ditrichaceae)

Ditrichum flexicaule (Schwägr.) Hampe, Flora 50: 182. 1867.

Cynodontium flexicaule Schwägr., Sp. Musc. Frond. Suppl. 1(1): 113, plate 29. 1811.

Leptotrichum flexicaule Hampe

Wyoming (FNA Vol. 27, 2007). (As *Leptotrichum flexicaule*) In the spray of the falls, Tower Falls, Yellowstone Natl Park (*Nelson 3549*), Porter (1935). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Sheridan Co.: mineral soil on limestone, Bighorn Natl Forest, T57N, R89W, Sect. 27, 16 Jun 1992, *McKee 92-025* (BUF, RM) with *Dicranum scoparium*. Yellowstone Natl Park: *Nelson & Nelson 5912* (RM).

Ditrichum gracile (Mitt.) Kuntze, Revis. Gen. Pl. 2: 835. 1891.

Leptotrichum gracile Mitt., Hook.'s J. Bot. Kew Gard. Misc. 3: 353. 1851.

Ditrichum crispatisimum (Müll. Hal.) Paris

Ditrichum giganteum R.S. Williams

Leptotrichum crispatisimum Müll. Hal.

Wyoming (FNA Vol. 27, 2007).

DREPANOCLADUS (Müll. Hal.) G. Roth, Hedwigia 38(Beibl.): 6. 1899, name conserved. (Amblystegiaceae)

Hypnum subsect. *Drepanocladus* Müll. Hal., Syn. Musc. Frond. 2: 321. 1851; *Calliergidium* (Ren.) Grout

Drepanocladus aduncus (Hedw.) Warnst., Beih. Bot. Centralbl. 13: 400. 1903.

Hypnum aduncum Hedw., Sp. Musc. Frond., 295. 1801.

Brachythecium edentatum R.S. Williams

Calliergidium bakeri (Ren.) Grout

Drepanocladus aduncus var. *kneiffii* (Schimp.) Mönk.

Drepanocladus aduncus var. *polycarpus* (Voit) G. Roth

Drepanocladus aduncus var. *pseudofluitans* (Sanio) Głowacki

Drepanocladus kneiffii (Schimp.) Warnst.

Drepanocladus simplicissimus Warnst.

Drepanocladus stagnatus Żarnowiec

Wyoming (FNA Vol. 28, 2014). Wyoming: Yellowstone Natl Park (1567, 1579) (Roell 1893); Yellowstone Natl Park, Deer Lodge (1418) (Roell 1893); as var. *kneiffii* Sch. Yellowstone

Natl Park (1561a, 1577a) (Roell 1893); Yellowstone Natl Park (1547) (Roell 1893); var. *pungens* (H. Müll. (sic)) Yellowstone Park (1576) (Roell 1893); var. *laxum* Sch. Yellowstone Natl Park (1577a, 1578a) (Roell 1893: 274). Albany County, Carbon County, Lincoln County, Sheridan County, Sublette County, Teton County, Uinta County, and Yellowstone Natl Park. Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

“The following varieties and forms have been recorded: var. *aquaticus* forma *capillifolius*; var. *polycarpus* formae *gracilescens* and *filicuspis*; and var. *Kneiffii*, Porter (1935). Sublette Co.: “Species occupying peatland expanses and spring fens ... tolerant of long periods of saturation and submersion,” Cooper & Andrus (1994). Albany, Lincoln, Sublette, Teton, Uinta Cos., Yellowstone Natl Park, Porter (1937). Lawton. Teton Co., Spence (1985).

Albany Co.: 10,000 ft, leaf mold, *Hermann 17693 1/2* (RM); NW base of Sheep Mtn., seep area (calcareous fen) with *Populus*, *Betula*, and *Salix*, *Buck 23244* (NY). Big Horn Co.: Big Horn Natl. Forest, Lake Solitude Quad., Cloud Peak Wilderness area, 9840 ft, filled-in lake, 5 Aug 1992, *Zacharkevics s.n.* (BING). Fremont Co.: 8400 ft, *Hermann 25525* (RM). Johnson Co.: Big Horn Natl Forest, Cloud Peak Quadrant, Cloud Peak Wilderness Area, 10,800 ft, T51N R85W, Sect. 18., 23 Jul 1992, *Zacharkevics s.n.* (BING). Laramie Co.: *Hermann 25920* (RM). Lincoln Co.: moist open willow flat along Fire Trail Creek at Greys River, 6400 ft, Salt River Range, 8 mi E of Alpine Junction, *Hermann 25587* (RM). Park Co.: 7500 ft, *Hermann 20048* (RM); wet marly substrate, in calcareous fen at base of Cathedral Cliffs, 2 mi E of Crandall Ranger Station, 6600 ft, 19 Apr 1992, *Elliott 1928* (BUF). 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 7799* (BING). Teton Co.: on US 26 & US 237, 1.3 mi W of Togwotee Pass, Bridger-Teton Natl. Forest, ca. 9000 ft, *Picea-Pinus flexilis* woodland, xeric but for stream bottoms, 6 Jul 1985, *Eckel 94082108* (BUF). Yellowstone Natl Park: grassy seep, swale, roots of *Salix*, 6,239 ft, a few miles from Mammoth Hot Springs on Road to Tower, with *Aulacomnium palustre*, *Amblystegium juratz.*, *Brachythecium frigidum*, *Bryum pseudotriquetrum* var. *bimum*, *Distichium capillaceum*, *Bryoerythrophyllum recurvirostrum* & *Saonia uncinatus*, *Leptobryum pyriforme*, *Plagiomnium rugicum*, *Plagiothecium denticulatum*, 6 Jul 1995, *Eckel 95082829* (BUF).

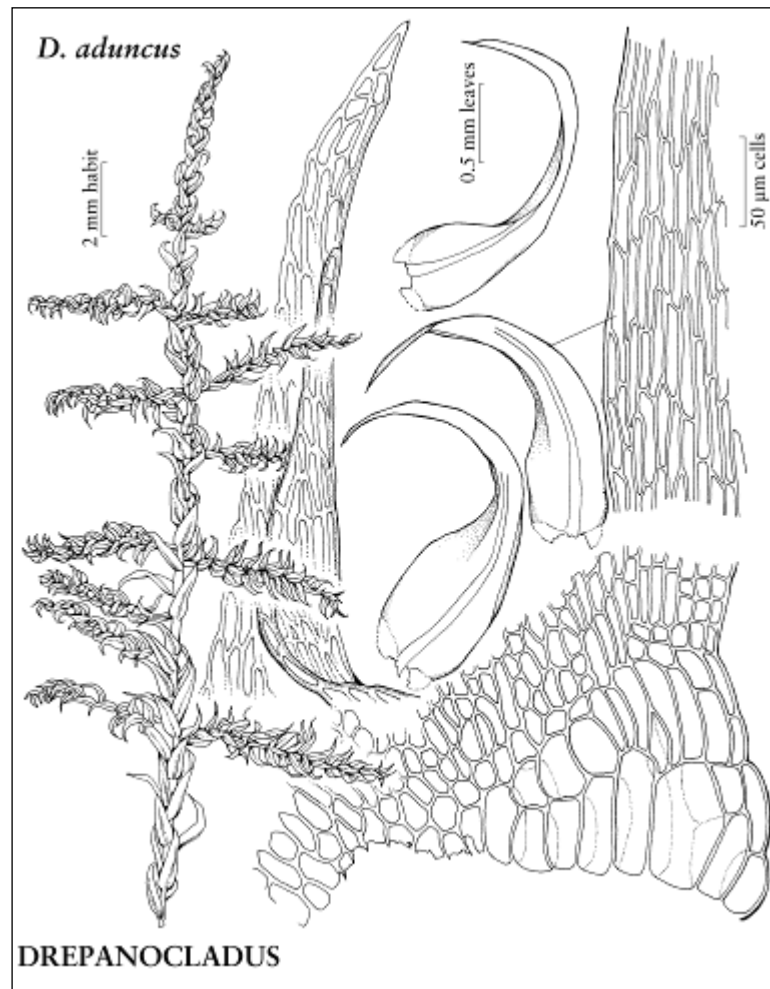
The alar cells of this species are described as hyaline and thin. *Drepanocladus exannulatus* has alar cell walls yellow or brown, thin or slightly thickened. I find *D. aduncus* soft with leaves easily coming off, whereas *D. exannulatus* is coarse with alar regions often staying on the stem.

(As var. *kneiffii* (Schimp. in B.S.G.) Mönk.) County?: Little Laramie River, *Nelson 4294* (RM). Albany Co.: NW 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, wet rotting log, 7 Jun 1993, *Reese 18176* (LAF, BUF, RM). Big Horn Co.: Big Horn Natl Forest, Lake Solitude Quadrant, T50N R87W, Sect. 12, 9600 ft, 5 Aug 1992, *Zacharkevics s.n.* (BING). Lincoln Co.: Cokeville, 11 Jun 1898, *Nelson 4626* (RM). Uinta Co.: Fort Bridger, 9 Jun 1898, *Nelson 4609* (RM).

The leaves lie flat and the inflations seem gradual, not abrupt, as in var. *polycarpus*. The leaves are straight, falcate-secund in var. *polycarpus*. Care must be had here not to confuse this species with *Cratoneuron filicinum*, which has a stouter, longer costa and whose cells are short and thick as in *Amblystegium* with serrated leaf margins. Also one might want to suppose this plant a *Brachythecium*, such as *B. nelsonii* (concave leaf bases) or *B. starkei* (serrated margins): var. *kneiffii* is flat, entirely smooth leaf margins and with short cells. “The studied two isosyntypes of *Hypnum kneiffii* var. *filiforme* S. Berggren consist of the species *Drepanocladus aduncus*, and *D. sordidus* and *Scorpidium cossonii* “ (Hedenäs in FNA Vol. 28, 2014).

(As var. *polycarpus* (Bland. ex Voit) Roth): Albany Co.: ca. 4 air mi ESE of Centennial, NW base of Sheep Mountain along WY 11, 7700–7900 ft, *Populus*, *Betula*, and *Salix* associated with spring seep, open fen, 7 Jun 1993, *Miller 10,271* (NYS). Park Co.: 3200 m, *Weber B-44314* (RM, COLO). Yellowstone Natl Park: along Firehole River near Old Faithful; border of mudpot, 6 Jul 1934, *Frye s.n.* (RM); in Gibbon Canyon, *Nelson 6747a* (RM); Yancey's, in a bog, 16 Jul 1899, *Nelson & Nelson 5903* (RM), note by Porter of Grout det. as this variety.

“Because *Drepanocladus aduncus* is variable in habit, several taxa have been segregated from this species. The phenotypes most frequently recognized at the species level were small plants with short laminal cells and weak costae called *D. polycarpus*” (Hedenäs in FNA Vol. 28, 2014). There is sometimes confusion with *Cratoneuron*, which is rarely if ever without teeth on the margin.



Courtesy FNA Association, FNA 28, 2014

Drepanocladus capillifolius (Warnst.) Warnst. = *Drepanocladus longifolius* (Wilson ex Mitt.) Broth. ex Paris

Drepanocladus crassicostatus Janssens = *Drepanocladus longifolius* (Wilson ex Mitt.) Broth. ex Paris

Drepanocladus exannulatus (Schimp. in B.S.G.) Warnst. = *Sarmentypnum exannulatum* (Schimp.) Hedenäs

Drepanocladus fluitans (Hedw.) Warnst. = *Warnstorfia fluitans* (Hedw.) Loeske

Drepanocladus longifolius (Wilson ex Mitt.) Broth. ex Paris, Coll. Nom. Broth., 10. 1909.

Amblystegium longifolium Wilson ex Mitt., J. Linn. Soc., Bot. 12: 571. 1869.

Drepanocladus aduncus var. *capillifolius* (Warnst.) Riehmer

Drepanocladus capillifolius (Warnst.) Warnst.

Drepanocladus crassicostatus Janssens

Wyoming (FNA Vol. 28, 2014). (As *Drepanocladus capillifolius*) Two stations in southern Wyoming are reported by Janssens (1983). (As *Drepanocladus crassicostatus*) “Yellowstone Natl Park, Lost Lake, Welch 16387 (CANM)” Janssens (1983). Lost Lake and tributaries, in puddle, shore of Lost Lake, Welch 16387 (CANM) Aug 17 1953. Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

(As *Drepanocladus capillifolius*) Carbon Co.: Wagon Hound Creek, 21 Aug 1897, *Nelson 4262*, with thick walled auricular cells, a robust plant all over and capillifoliate leaves (RM). Sheridan Co.: Dome Lake, 16 Jul 1896, *Nelson 2408* (RM).

The tips of the Welch specimen were brush like, collected into a tuft, but the tuft was curled, as were the leaves, not erect. The costa was very wide in leaves of the main stem “often occupying 1/3 to 1/2 of the leaf base. The alar cells are not as well differentiated as in other species of the genus (from Janssens 1983).

Drepanocladus revolvens (Sw.) Warnst. = *Scorpidium revolvens* (Sw.) Rubers

Drepanocladus polygamus (Schimp.) Hedenäs, Bryologist 100: 82. 1997.

Amblystegium polygamum Schimp. in Bruch & Schimper, Bryol. Europ. 6: 60, plate 572. 1853.

Campyliadelphus polygamus (Schimp.) Kanda

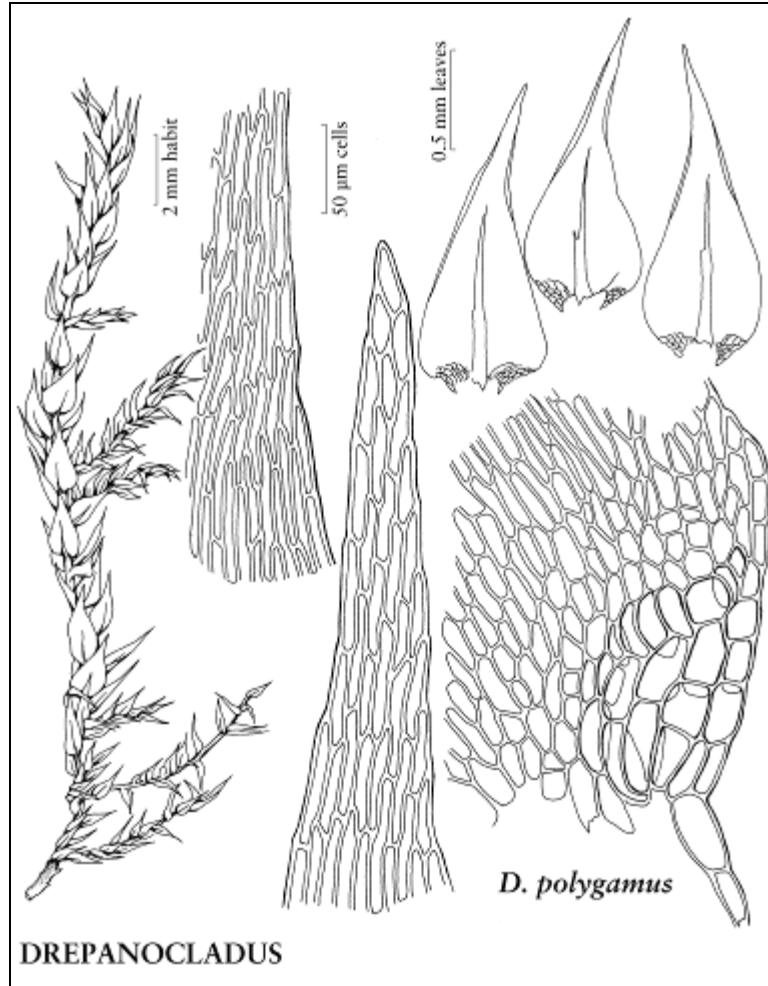
Campylium polygamum (Schimp.) C.E.O. Jensen

Campylium polygamum var. *fluitans* Grout

Campylium polygamum var. *minus* (Schimp.) G. Roth

Wyoming (FNA Vol. 28, 2014). (As *Hypnum polygamum* var. *fallaciosum* (Jur.) Ren. & Card. (*Hypnum fallax* Jur.) Wyoming: Yellowstone Natl Park (1566) (Roell 1893). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: 10,000 ft, *Hermann 17691* (RM).



Courtesy FNA Association, FNA 28, 2014

[*Drepanocladus sendtneri* (Schimp.) Warnst. (Amblystegiaceae) excluded]
Drepanocladus sendtneri var. *wilsonii* (Lindb.) Warnst.

This species has apparently been excluded from North America (early version of FNA Vol. 28, 2014); see Crum and Anderson (1981) citation below. “Because the species of the *Drepanocladus sendtneri* (Schimp. ex H. Müll.) Warnst. and *D. aduncus* complexes have only recently been understood, the North American distribution of *D. sordidus* is at present likely to be incompletely known. The Eurasian and African *D. sendtneri* is a species of strongly calcareous areas, where it usually grows in shallow fens or in periodically wet depressions. It is most safely distinguished from *D. sordidus* by a different ratio of median leaf lamina cell length (μm) to leaf length (mm), between 17.9–24.4 (between 23.3–36.5 in *D. sordidus*). Although no examined specimens originally identified as *D. sendtneri* from North America have turned out to belong to this species, it may still be premature to completely exclude the possibility that this otherwise widespread species occurs also on this continent” (Hedenäs, an earlier version of FNA Vol. 28, 2014).

Evanston, Uinta County (Nelson 8125), Porter (1935). Uinta Co., Porter (1937).

Possible specimens of *D. sendtnerii*: Uinta Co.: Evanston, submerged in a pool, Plants of Wyoming exsiccata, *Nelson 8125* (RM). Sublette Co.: Bridger Wilderness, Wind River Range *Carex*

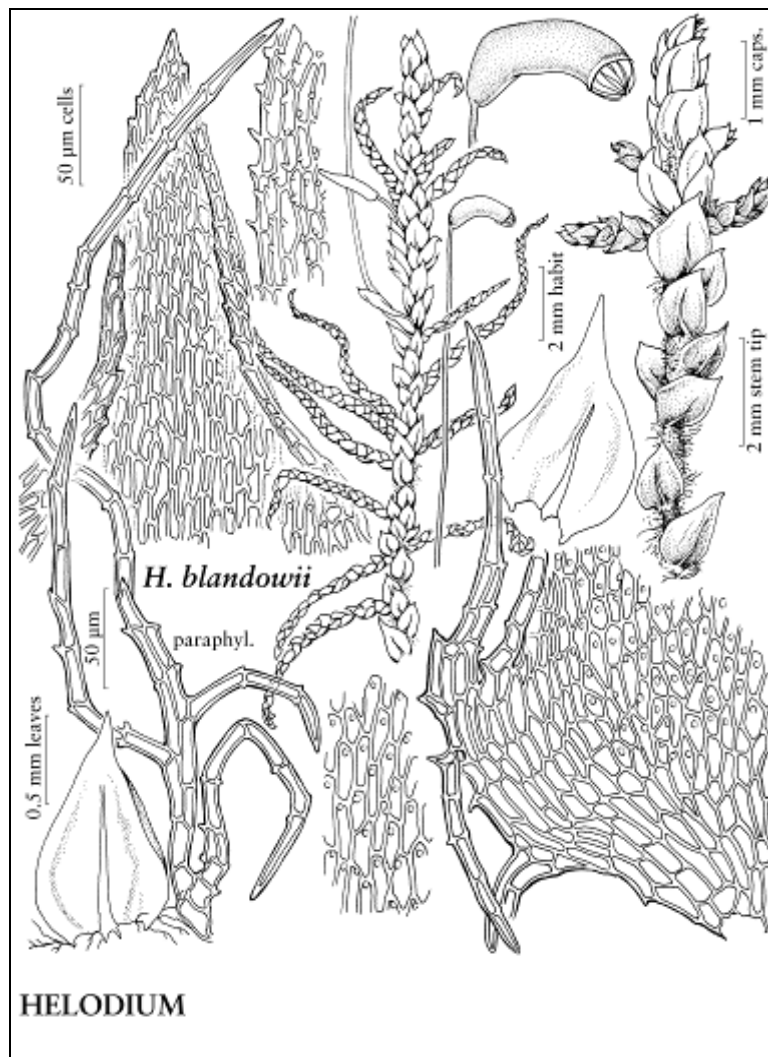
fen S of Timico Lake, 18 May 1989, *Andrus 7894* (median cells porose) (BING). Yellowstone Natl. Park: Fountain Geyser, 29 Aug 1951, *Lawton 1511* (by reason of the alar cells thick walled, costa stout) (YELLO); Lost Lake outlet, 1 Sep 1948, *Conard 48-227* (YELLO).

Mentioned by Lawton (1971). Crum and Anderson (1981: 963) lumped this with *D. aduncus* (Hedw.) Warnst.

Drepanocladus uncinatus (Hedw.) Warnst. = *Sanionia uncinata* (Hedw.) Loeske

ELODIUM (Sull.) Aust., Musci Appalach., 52. 1870. (Helodiaceae)

Hypnum sect. *Elodium* Sull. in A. Gray, Manual ed. 2, 668. 1856; *Helodium* Warnst., name conserved.



Courtesy FNA Association, FNA 28, 2014

Elodium blandowii (F. Weber & D. Mohr) Eckel, Phytoneuron 2012–70: 6. 2012.

Hypnum blandowii F. Weber & D. Mohr, Bot. Taschenbuch, 332. 1807 (as *blandovii*).

Helodium blandowii (F. Weber & D. Mohr) Warnst.

Helodium lanatum (Brid.) Broth.
Hypnum lanatum Brid.
Leskea blandowii (F. Weber & D. Mohr) Mitt.
Thuidium blandowii (F. Weber & D. Mohr) Schimp.

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). (As *Helodium lanatum* (Brid.) Broth.) Albany Co. (Nelson 1746 & 2700; Porter 935 & 1441), Porter (1935). (As *Thuidium blandowii*) Yellowstone Natl Park: a specimen was noted by Roell (1893) for Yellowstone (number 1531). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: Centennial Valley, 19 Aug 1895, *Nelson s.n.* (RM); Centennial Hills, *Nelson 2700* (RM). Yellowstone Natl Park: 1 Sep 1948, *Conard 48-232* BUF.

ENCALYPTA Hedw., Sp. Musc. Frond., 60. 1801. (Encalyptaceae)

[*Encalypta alpina* Smith in J.E. Smith et al., Engl. Bot. 20: 1419. 1805, excluded.]

Not reported for Wyoming in FNA (FNA Vol. 27, 2007). Albany Co.: Porter (1937).

Horton (1983), in a distribution map for this species, gives no reference to occurrences in Wyoming. *Encalypta alpina* seems therefore to be disjunct from Alberta to Colorado.

Encalypta ciliata Hedw., Sp. Musc. Frond., 61. 1801.

Encalypta alaskana Kindb. in Macoun
Encalypta ciliata var. *microstoma* Schimp.
Encalypta laciniata Lindb.

Wyoming (FNA Vol. 27, 2007). In all states and provinces of the Pacific Northwest; Alaska, California, Arizona, Colorado; South Dakota, Iowa, Minnesota, Wisconsin, Michigan, Ontario; Nova Scotia. Crook Co., Porter (1937). Several localities in central Wyoming are indicated on a dot map by Horton 1983 (montane).

[*Encalypta contorta* Hoppe ex Lindb. = *E. streptocarpa* Hedw., an Old World species, excluded from North America by Anderson et al. 1990; confirmed by Magill (FNA Vol. 28 2014).]

Albany County (*Porter 675*), Porter (1935); perhaps a specimen of *Encalypta procera*, which strongly resembles *E. streptocarpa*.)

Encalypta procera Bruch, Abh. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. 1: 283. 1832.

Encalypta streptocarpa sensu American authors (see Crum & Anderson 1981: 265).

Wyoming (FNA Vol. 27, 2007). Horton (1983) on a dot-distribution map gives a literature report for Wyoming but with two dots on state boundaries so that the state in which the reported occurrence lies is ambiguous. (As *Encalypta streptocarpa* Hedw.) Albany Co., Porter (1937).

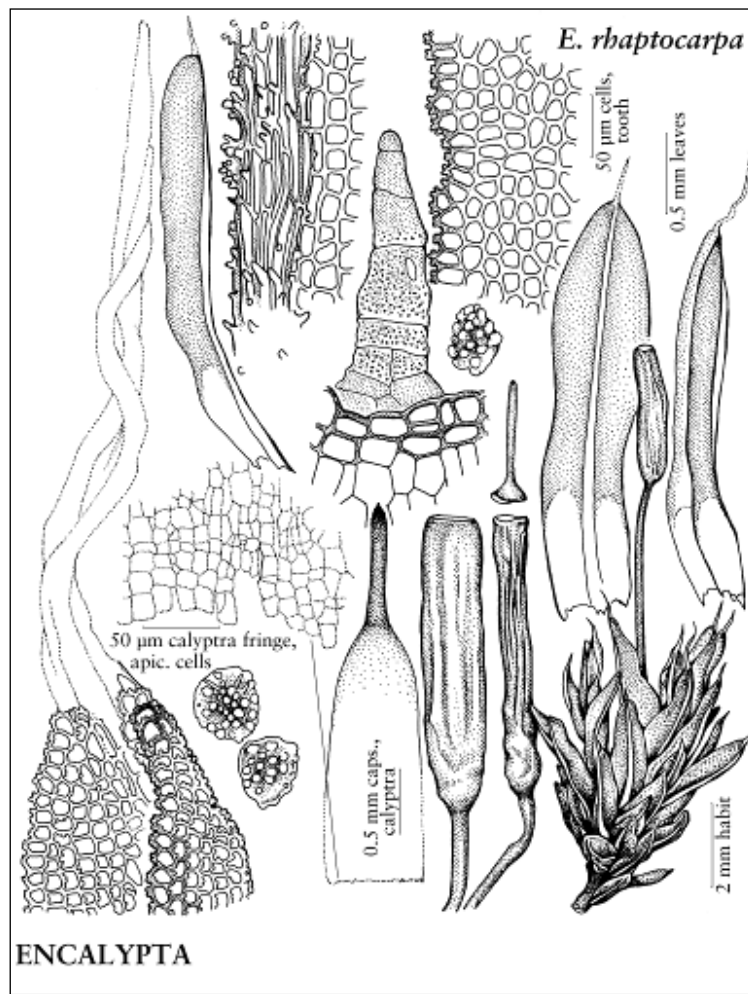
Encalypta rhaptocarpa Schwägr., Sp. Musc. Frond. Suppl. 1(1): 56. 1811.

Encalypta intermedia Juratzka
Encalypta rhaptocarpa Schwägr.

Encalypta raptocarpa var. *microstoma* Limpr.
Encalypta raptocarpa var. *subspathulata* (Müll. Hal. & Kindb.) Flowers
Encalypta subspathulata Müll. Hal. & Kindb. in Macoun
Encalypta vulgaris var. *raptocarpa* (Schwägr.) Lawton

Wyoming (FNA Vol. 27, 2007). In all states and provinces of the Pacific Northwest; Alaska, Yukon, California, Nevada, Colorado; South Dakota. (As *Encalypta raptocarpa* Schwaeg.) Albany County (*Porter 694*), Carbon (*Goodding 75*), (Sheridan Co.) *Porter (1935)*. (As *E. raptocarpa*) Uinta Co., "has been collected by Nelson in Albany and Carbon Counties," *Wynne (1943)*. Shoshone Natl Forest, NW Wyoming, *Kosovich-Anderson (2010)*.

Albany Co.: Laramie Mountains, Roger Canyon, 7 air mi NE of Laramie city center, limestone outcrops with *Cerocarpus montanus*, *Artemisia cava*, *A. tripartita*, *A. nova*, *A. tridentata*, on soil below rock outcrop, 7 Jun 1993, *Miller 10,233* (NYS). Fremont Co.: Bridger-Teton Natl. Forest on US 26 & US 287, between Moran & Dubois, ca. 9000 ft, alpine meadow, much herbage, wet with flowing streams, granite outcrops, N slopes of low knoll, c.fr., with *Tortula ruralis*, *Eckel 93081101* (BUF). Park Co.: soil in crevice of granite outcrop along Crandall Creek, Shoshone Natl. Forest, 36 mi NW of Cody, 6500 ft *Hermann 20039* (RM). Sublette Co.: 7950 ft, *Hermann 25340* (RM).



Courtesy FNA Association, FNA 27, 2007

Encalypta spathulata Müll. Hal., Syn. Musc. Frond. 1: 519. 1849.

Wyoming (FNA Vol. 27, 2007). “*Encalypta spathulata* is very similar to *E. rhaptocarpa* but differs in the fringed calyptra base and weakly striate, eperistomate capsule. The gymnostomous capsules and long awn will separate *E. spathulata* from other species of the genus” (Magill, FNA Vol. 27, 2007).

Encalypta vulgaris Hedw., Sp. Musc. Frond., 60. 1801.

Encalypta vulgaris var. *apiculata* Wahlenb.

Encalypta vulgaris var. *mutica* Brid.

Wyoming (FNA Vol. 27, 2007). (As *Encalypta extintoria* (L.) Sw. (= *Encalypta vulgaris* Hedw. cf. Hedw., Spec. Musc. 60. 1801. Index Muscorum). “The plants so far found all belong in var. *mutica* Brid. Plumbago Canyon, Telephone Canyon, both in Albany County, Porter (1935).) In all states and provinces of the Pacific Northwest; California, Nevada, Utah, New Mexico, Colorado; Saskatchewan, Manitoba. (As *Encalypta vulgaris* Hedw.) Albany Co., Porter (1937). (As *E. vulgaris* var. *mutica* Brid.) Sweetwater Co., “the only other collection of *E. vulgaris* the author has seen from Wy. was collected in the Laramie Mts., (C. L. Porter 796),” Wynne (1943). Campbell Co., Medina (1994). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: Roger Canyon, 8000 ft, *Hermann 17151* (RM); Laramie Mtns., Roger Canyon, ca. 8 air mi NE of Laramie, on Co. Rd. 17, limestone outcrops with *Cercocarpus montanus*, *Buck 23163* (NY). Big Horn Co.: Big Horn Mtns, T49N R 87W S25, ca. 1 air mi SW of Tyrrell Ranger Station; Sect. 25 & 36, E-facing slope, 8800 ft, 21 Jun 1979, *Hartman 9150*, calyptrate, capsules very young (RM). Crooke Co.: on WY 585, 0.8 mi N of Weston Co. line, grassland with some *Artemisia* scrub, with *Pterygoneurum ovatum*, *Tortula ruralis*, *Didymodon rigidulus* var. *gracilis*, 12 Jul 1985, *Eckel 419686* (BUF, RM). Fremont Co.: 7800 ft, *Hermann 25534* (RM). Park Co.: 7500 ft, *Hermann 20052* (RM). Sheridan Co.: vertical rock face, moist limestone, Big Horn Natl Forest, T57N, R89W, Sect. 27, c.fr., 16 Jun 1992, *McKee 92-016*, calyptrate, capsules nearing maturity (BUF, RM). Uinta Co.: Evanston, on dry ground, 8 Jul 1942, *Degener 17074*, c.fr. (in a packet of fruiting *Bryum caespiticium* and filed under that name) (US).

Eurhynchium oreganum (Sull.) A. Jaeg. = *Kindbergia oregana* (Sull.) Ochyra

Eurhynchium pulchellum (Hedw.) Jenn. = *Eurhynchiastrum pulchellum* (Hedw.) Ignatov & Huttunen

EURHYNCHIASTRUM Ignatov & Huttunen, Arctoa 11: 260. 2003 (Brachytheciaceae)

Eurhynchiastrum pulchellum (Hedw.) Ignatov & Huttunen, Arctoa 11: 262. 2003.

Hypnum pulchellum Hedw., Sp. Musc. Frond., 265, plate 68 (top), figs. 1–4. 1801.

Eurhynchium diversifolium B.S.G.

Eurhynchium fallax (Ren. & Card.) Grout

Eurhynchium strigosum (Web. & Mohr) B. S. G.

Eurhynchium strigosum var. *fallax* Ren. & Card.

Eurhynchium strigosum var. *robustum* Roell

Eurhynchium substrigosum Kindb. in Macoun

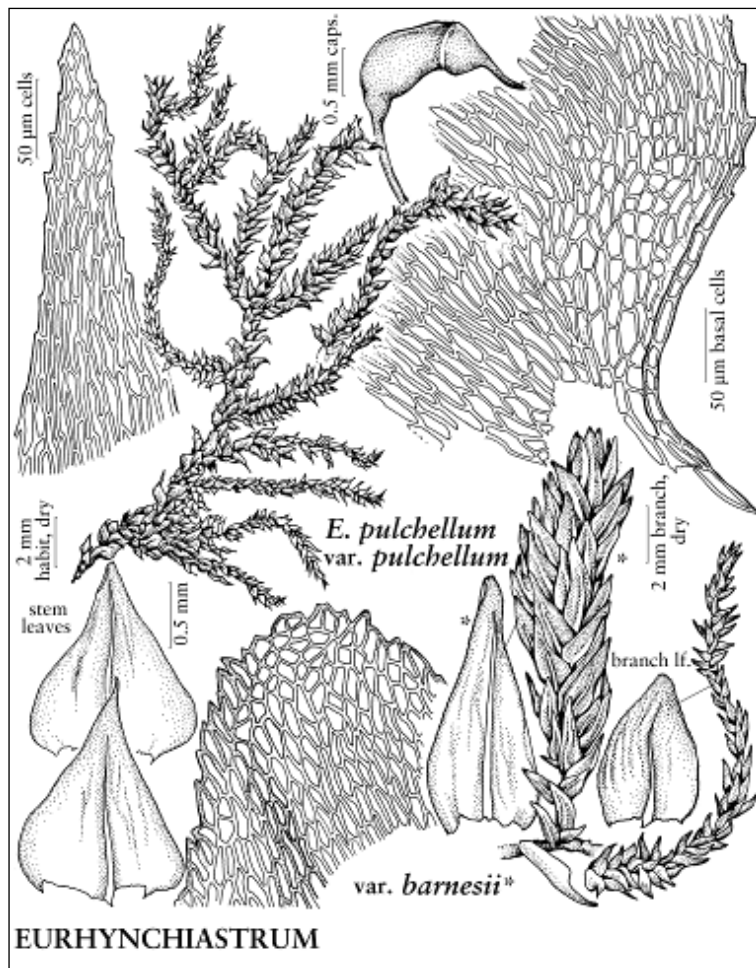
Hypnum strigosum Web. & Mohr

Var. **pulchellum** or s.l.

(As *Eurhynchium strigosum*) Wyoming: Yellowstone Natl Park (1548, 1549) (Roell 1894). (As *Eurhynchium diversifolium* (Schleich.) B. & S.) Pole Mt., Albany County (Porter 540), Porter (1935). (As *Eurhynchium diversifolium* (Schleich.) B. & S.) Albany Co., Porter (1937). Campbell Co., Medina (1994).

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, on soil, 7 Jun 1993, *Miller* 10,258 (NYS). Fremont Co.: Jozwik 482 (RM). Weston Co.: *Eckel* 623686 (RM, BUF). Sublette Co.: Bridger-Teton Natl Forest, 4.6 mi N of Bondurant on US 191 & 189, sandstone rocks, lush herbage, Hoback River valley, with *Saionia uncinata*, *Brachythecium salebrosum*, *Leptodictyum humile*, *Platydictya jungermanniioides*, 5 Jul 1985, *Eckel* 9612522 (BUF).

There is a var. *barnesii* (Ren. & Card.) Grout (1990 checklist) as *Eurhynchiastrum pulchellum* var. *barnesii* (Ren. & Card.) Ignatov, but not yet known for Wyoming; its taxonomy is problematic (Ignatov, FNA Vol. 28, 2014). Note form *praecox* is julaceous and resembles *Brachythecium collinum*, also julaceous, by the coarse serrations. The latter, however, has cells in the apices of all leaves that are elongate (greater than 2: 1). *Eurhynchiastrum pulchellum* is more broadly deltoid at the leaf base, *B. collinum* more ovate-lanceolate. The obtuse to broadly acute apices of the branch leaves are more characteristic of *E. pulchellum*.



Courtesy FNA Association, FNA 28, 2014

FISSIDENS Hedw., Sp. Musc. Frond., 152. 1801. (Fissidentaceae)
Moenkemeyera Müll. Hal.; *Octodiceras* Brid.

Fissidens adianthoides Hedw., Sp. Musc. Frond., 157. 1801.
Fissidens adianthoides var. *immarginatus* Lesq. & James

Wyoming (FNA Vol. 27, 2007). On moist soil banks, logs, calcareous and noncalcareous rocks and cliffs. Throughout the Pacific Northwest; Alaska, Northwest Territory, California; Ontario to Labrador and south to Arkansas and Florida. Teton Co., Spence (1985).

Teton Co.: Teton Natl Park, Taggart Lake, 13 Aug 1953, *Lawton 1730* (WTU). Yellowstone Natl Park: Crescent Hill, 17 Aug 1953, *Lawton 1856* (WTU).

Fissidens bryoides Hedw., Sp. Musc. Frond., 153. 1801.
Dicranum viridulum Sw.
Fissidens andersonii Grout
Fissidens bryoides var. *incurvus* (Starke) Hüb.
Fissidens bryoides var. *pusillus* (Wils.) Pursell
Fissidens exiguus Sulliv.
Fissidens exiguus var. *falcatulus* (Ren. & Card.) Grout
Fissidens pusillus (Wils.) Milde
Fissidens synoicous Sulliv.
Fissidens viridulus (Sw.) Wahlenb.
Fissidens viridulus var. *texanus* (Lesq. & James) Grout

Wyoming (FNA Vol. 27, 2007). In shaded areas, commonly on moist soil banks or on soil over logs and rocks, from the lowlands to 2000 m or higher. British Columbia, Washington, Oregon, Idaho, Montana, Wyoming; California; South Dakota, Minnesota; Ontario to Maine and south to Texas and Florida. 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 Route 130, 8500 ft, Medicine Bow Mts., ca. 4 mi W of Centennial, 5 Aug 1962, c.fr., *Hermann 17774* (RM, WTU). Sheridan Co.: on vertical rock face, moist limestone, Big Horn Natl Forest, T57N, R89W, Sect. 27, 16 Jun 1992, *McKee 92-024* (RM), c.fr., mature, indehisced, with *Bryoerythrophyllum recurvirostrum*, *Didymodon vinealis* (var. *flaccida*), *Distichium capillaceum*, *Platydictya jungermannioides*.

Fissidens minutulus Sull., often confused with *F. bryoides*, is a good species, occurring along and east of the Mississippi River (also California); *Fissidens limbatus* is a synonym of *F. crispus* (R. Pursell, pers. comm., Aug 23, 2013). *Fissidens crispus*, with a western distribution, is to be expected in Wyoming.

Fissidens grandifrons Brid., Muscol. Recent., Suppl. 1: 170. 1806.
Pachyfissidens grandifrons (Brid.) Limpr.

Wyoming (FNA Vol. 27, 2007). On limestone, sometimes submerged, in streams, waterfalls, or other wet situations. British Columbia, Washington, Oregon, Idaho, Montana, Wyoming; Alaska, California, Utah, Nevada; Michigan and Ontario to New York, south to Arkansas, Kentucky, Tennessee, and Alabama. Junction of Nez Perces Creek with Firehole River, Yellowstone Natl Park (*Porter 1247*). Very abundant at this locality, Porter (1935).

Sheridan Co.: on rocks in streambed in rapidly flowing water, calcareous region, Dry Fork and Garland Gulch, T57N, R89W, 22 Jun 1992, *McKee 92-043 & 92-044* (BUF, RM). Yellowstone Natl Park: along the Firehole River, on partly submerged rocks in a small stream, 5 Aug 1932, *Porter 1247* (NY, WTU); Black Sand Basin, 18 Aug 1953, *Lawton 1868* (WTU); calcareous rock bed of cascade from large spring along the Firehole River near Madison Junction, Aug 1936, *Drexler 829* (NY); between Madison and Old Faithful, in western exposure, canyon, *Pseudotsuga-Pinus contorta* forest, 2320–2350 m, dripping water, 8 Aug 1981, *Duell 2267/4* (NY).

Fissidens obtusifolius Wilson, London J. Bot. 4: 196, plate 9, fig. b. 1845.

Fissidens obtusifolius var. *kansanus* Ren. & Card.

Fissidens obtusifolius var. *marginatus* Flowers

Not reported for Wyoming in FNA (FNA Vol. 27, 2007).

Albany Co.: Laramie Mts., Roger Canyon, ca. 8 air mi NE of Laramie, 2400 m, limestone outcrops with *Cercocarpus montanus* dominant, *Buck 23160* (NY), with *Bryoerythrophyllum recurvirostrum* and *Didymodon rigidulus* var. *gracilis*.

Apices of the above specimen are too broad for var. *apiculatus* Grout, with variations on the same stem of costa ending to nine cells before the apex. The broad leaves are apiculate, but not broadly acute in all leaves. The intramarginal border in the lower leaves on the vaginant lamina, corresponding to the var. *marginatus* Flow. There are vars. *apiculatus* Grout, var. *kansanus* Ren. & Card. and var. *marginatus* Flow. in the Anderson et al. (1990) checklist.

Fissidens osmundioides Hedw., Sp. Musc. Frond., 153, plate 40, figs. 7–11. 1801.

Not reported for Wyoming in FNA (FNA Vol. 27, 2007). Teton Co., Porter (1937). Teton Co., Spence (1985). Johnson Co., in association with *Warnstorfia tundrae* (Lenz 2006). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Park Co.: W of Bear Tooth Butte, Crazy Creek campground, 22 Aug 1953, *Lawton 2019* (WTU), det. R. Pursell. 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 *Fissidens osmundioides*, 14 May 1989, *Andrus 7795b* (BING).

The *Lawton 2019* specimen had a costae ending short of the apex, vaginant laminae long and broad, cells of vaginant laminae epapillose, and rhizoids papillose (noted by R. Pursell).

Fissidens sublimbatus Grout, Moss Fl. N. Amer. 1: 13, plate 13, fig. A. 1936.

Fissidens obtusifolius var. *apiculatus* Grout

Wyoming (FNA Vol. 27, 2007). A species of soil in the arid lowlands in Wyoming, "...often partially buried, often under overhanging rocks and boulders, and in the shade of trees and shrubs" (Ireland, FNA Vol. 27, 2007). It is found in the arid states, south of Wyoming, such as New Mexico and Arizona and "Indeed, it appears to be the only species of the genus found in Death Valley" (Ireland FNA).

FONTINALIS Hedw., Sp. Musc. Frond., 298. 1801. (Fontinalaceae)

Fontinalis antipyretica Hedw., Sp. Musc. Frond., 298. 1801. (*Fontinalis* s.l.)

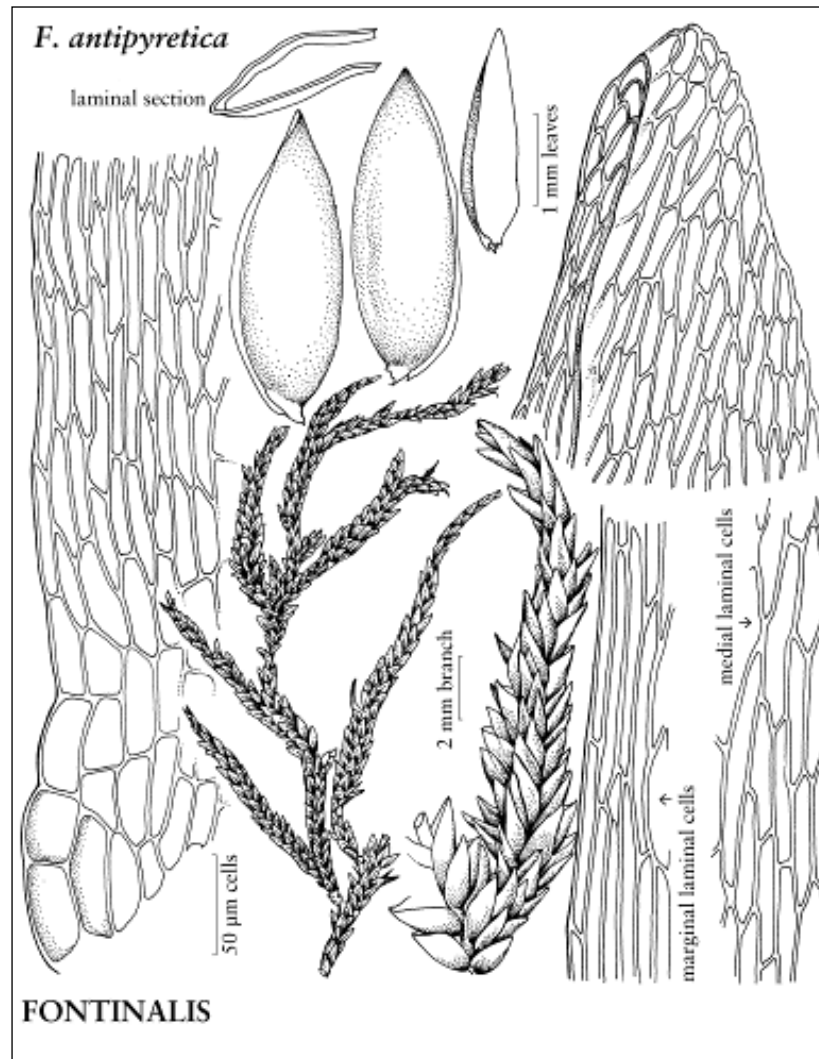
Fontinalis allenii Card.

Fontinalis antipyretica var. *gigantea* (Sull. ex Sull. & Lesq.) Sull.

Fontinalis antipyretica var. *mollis* (Müll. Hal.) Welch

Fontinalis antipyretica var. *oreganensis* Ren. & Card.
Fontinalis antipyretica var. *patula* (Card.) Welch in Grout
Fontinalis antipyretica var. *robusta* Card.
Fontinalis californica Sull.
Fontinalis gigantea Sull.
Fontinalis mollis Müll. Hal.
Fontinalis patula Card.
Fontinalis utahensis Card. & Thériot
Pilotrichum antipyretica (Hedw.) Müll. Hal.

Wyoming (FNA Vol. 28, 2014). Wyoming: Yellowstone Natl Park (1529) (Roell 1893). Medicine Bow Mts., Albany County (Nelson 9670), Porter (1935). *Fontinalis gigantea* Sulliv. Albany County, Carbon County, and Sheridan County, Porter (1935). (As *Fontinalis antipyretica* var. *gigantea* Sulliv.) Albany, Carbon, Sheridan cos., Porter (1937). (As *F. antipyretica* var. *mollis* (Müll. Hal.) Welch) Albany, Carbon cos., Porter (1937), and Lawton 1971). Teton Co., Spence (1985). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010). (As *Fontinalis antipyretica* var. *oregonensis* Ren. & Card.): Lincoln Gulch, Albany Co. (Nelson 2619), Porter (1935).



Courtesy FNA Association, FNA 28, 2014

Albany Co.: Lincoln Gulch, 12 Aug 1896, *Nelson 2619* (RM); W of Bear Tooth Butte along the Clark Fork of the Yellowstone River, 6940 ft, *Lawton 2004* (WTU), small pond of cold water in spruce-fir forest at University of Wyoming Science Camp, Centennial, *Dennings 1091* (WTU); swift streams, Medicine Bow Mts., *Nelson 9670*, exsiccata Plants of Wyoming (RM). Carbon Co.: submerged & partly floating in pool in marsh near North French Creek at logging road crossing, 8600 ft, Medicine Bow Mts., 6 mi E of Ryan Park, *Hermann 26719* (WTU); cold, shallow pool in meadow along North French Creek, Medicine Bow Mts., ca. 8500 ft, 6 mi E of Ryan Park, 19 Aug 1961, *Hermann 17186* (RM). Park Co.: Bear Tooth Mts., Crane Lake, in water, attached to rocks, *Welch 15079* (WTU). Sublette Co.: 10,324 ft, *Rolston 85127* (CSU); also 10,595 ft, *Rolston 85099* (CSU).

(As *Fontinalis antipyretica* var. *gigantea* (Sull.) Sull.): Albany Co.: in the swift water of the stream, Centennial, 7 Aug 1900, *Nelson 8001*, exsiccata, det. Holz. (RM). Fremont Co.: in the Popo Agie River S of Lander, 5200 ft, 30 Jul 1966, *Scott 883* (RM). Sheridan Co.: in spring bog, 29 Jul 1901, *Nelson 8521* (RM).

Fontinalis antipyretica var. *duriaei* (Schimp.) Husn. = *Fontinalis hypnoides* Hartman

Fontinalis antipyretica var. *hypnoides* = *Fontinalis hypnoides* Hartman

Fontinalis hypnoides Hartman, Handb. Skand. Fl. ed. 4, 434. 1843.

Fontinalis dalecarlica var. *macounii* Card.

Fontinalis duriaei Schimp.

Fontinalis Holzingeri Card.

Fontinalis macmillanii Card.

Fontinalis nitida Lindb. & Arnell

Fontinalis nitida var. *angustiretis* Card. ex W.H. Welch

Fontinalis obscura Card.

Fontinalis subcarinata Card.

Fontinalis tenella (Card.) Card.

Fontinalis umbachii Card.

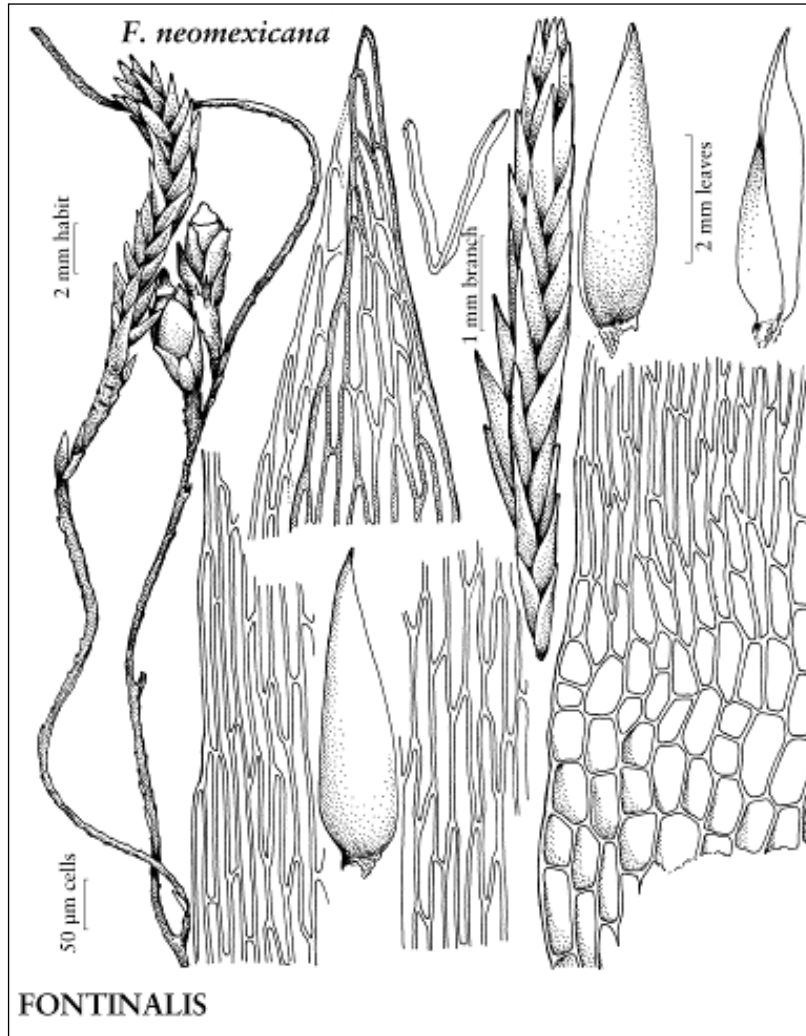
Wyoming (FNA Vol. 28, 2014). Wyoming: Yellowstone Natl Park (1554, 1582 and 1583) (Roell 1893). (As *Fontinalis antipyretica* var. *duriaei* (Schimp.) Husn. or as *Fontinalis duriaei* Schimp.) N. Vermillion Creek, Sweetwater County (*Nelson 3577*). “No specimens of this plant could be found although it is recorded by Dr. Nelson (1900),” Porter (1935). (As var. *duriaei*) North Vermillion Creek, *Nelson 3577* (RM). (As *Fontinalis antipyretica* var. *duriaei* (Schimp.) Husn.) Specimens that are “larger, laxer, and softer, with relatively broad leaves being the var. *duriaei*...smaller ones with relatively narrow leaves the var. *hypnoides*.” (*Fontinalis hypnoides* C.J. Hartm. var. *hypnoides* Albany Co., Yellowstone Natl Park, Porter (1937). (As *Fontinalis hypnoides*) Albany County and Yellowstone Natl Park, Porter (1935). (As *Fontinalis nitida* Lindb. & Arn.) Moorcroft, Crook County (*Nelson 2248*), Porter (1935). (As *Fontinalis duriaei* Schimp.) Sweetwater Co., Porter (1937). (As *Fontinalis nitida* Lindb. & Arn.) Crook Co., Porter (1937). Teton Co., Spence (1985).

Albany Co.: Hermann, 17781 (RM). (As var. *hypnoides* but sub *duriaei*) Little Laramie River, *Nelson 3328* (RM). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

(As *Fontinalis antipyretica* var. *duriaei* (Schimp.) Husn.) Albany Co.: Yuncker 12370 (RM); 10,000 ft, *Hermann 17221* (RM). Yellowstone Natl Park: 2 mi E of Fishing Bridge, Indian Pond, layered in the stack of diatom deposits about 20 ft in height, between Indian Pond and Yellowstone Lake, 12 Jun 1989, *Shero s.n.* (BUF).

(As *Fontinalis hypnoides*) Fremont Co.; 10,055 ft, *Rolston 86029* (CSU). Sublette Co.: Bridger Wilderness, Wind River Range ca. 1/4 mile SW of Barnes Lake, 9780 ft, 42°59'N, 109°36'W, floating in small lake with fen margin (leaves not keeled), 15 May 1989, *Andrus 7814* (BING).

“Plants of *F. antipyretica* found in swiftly moving streams often have leaves completely split along the keel and can be mistaken for *F. hypnoides*” (Allen in FNA Vol. 28, 2014)



Courtesy FNA Association, FNA 28, 2014

Fontinalis neomexicana Sull. & Lesq. in W.S. Sullivant, *Musc. Hepat. U.S.*, 224b. 1856 (as *neomexicana*).

Fontinalis columbica Card.

Fontinalis maritima Müll. Hal.

Fontinalis mercediana Lesq.

Wyoming (FNA Vol. 28, 2014). Albany County, Johnson County, Sheridan County, and Yellowstone Natl Park, Porter (1935). Albany, Johnson, Sheridan cos., Yellowstone Natl Park, Porter (1937). (As *Fontinalis neomexicana* var. *columbica* (Card.) Card.) Spring Creek, Yellowstone Natl Park (Nelson 6293), Porter (1935).

Albany Co.; 7800 ft., *Hermann 25931* (RM); *Nelson 7540* (RM); *Nelson 7540*, c.fr. (RM). Carbon Co.; 9200 ft, *Porter 9694* (RM). Johnson Co.; *Nelson 2506* (RM); Big Horn Mts., Sep 1892, *Hapemann s.n.* (RM). Yellowstone Natl Park: *Nelson & Nelson 6320* (RM); *Nelson & Nelson 6293* (RM).

FUNARIA Hedw., Sp. Musc. Frond., 172. 1801. (Funariaceae)

[*Funaria flavicans* Michaux, Fl. Bor.-Amer. 2: 303. 1803, probably excluded]

Not reported for Wyoming by FNA (FNA Vol. 27, 2007).

Centennial, Albany County (*Nelson 8699*); Dale Creek, Albany County (*Porter 712*), Porter (1935). Crum and Anderson (1981) and FNA (2007) report this species to not occur west of Missouri, Kansas and Nebraska.

Funaria hygrometrica Hedw., Sp. Musc. Frond., 172. 1801.

Var. **hygrometrica**

Funaria convoluta Hampe

Funaria flaviseta Warnst.

Funaria hygrometrica var. β B.S.G.

Funaria hygrometrica var. *patula* Aust.

Funaria hygrometrica var. *utahensis* Grout)

Wyoming (FNA Vol. 27, 2007). Wyoming: Yellowstone Natl Park c.fr., (*1493*) (Roell 1893). In all states and provinces of the Pacific Northwest; throughout the USA and Canada, cosmopolitan. (As *Funaria convoluta*) French Creek, Carbon County (*Goodding 2029*); (as *F. hygrometrica*) Albany, Sheridan, Sublette cos., Yellowstone Natl Park, Porter (1935). (As var. *utahensis*) Albany, Carbon cos., Porter (1937). (As var. *utahensis*) Wyoming, Flowers (1973).

Albany Co.: (as var. *utahensis*) Laramie, 29 Jul 1897, *E. Nelson 3453*; *Nelson 3461*, c.fr. (RM). Big Horn Co.: Big Horn Mtns., North Fork Crazy Woman Creek, 13 air mi SW of Buffalo, limestone outcrops and rocky slopes, shaded streamside, aspen woodlands and meadows, 6800 ft, c.fr., 28 Jun 1979, *Hartman 9708*, operculate (BUF, RM). Carbon Co.: (as var. *utahensis*) French Creek, wet ground in burnt alder patch, 28 Aug 1903, *Goodding 2029* (RM), (as var. *utahensis*). Johnson Co.: T49N R 83W S22, Big Horn Mts., North Fork Crazy Woman Creek, ca. 13 air mi SW of Buffalo; Sect. 22 & 27, limestone outcrops and rocky slopes, shaded streamside, and aspen woodlands with adjacent meadows; 6800 ft, 28 Jun 1979, *Hartman 9708* (RM). Park Co.: 6100 ft, 1 Apr 1988, *Vukelich s.n.* (BUF). Natrona Co.: Big Horn Mts., First Water Creek, dry creek bed and road crossing, 7700 ft, 1 Aug 1979, *Hartman 10452*, c.fr., operculate (RM).

The capsules in *Nelson 3453* are short pyriform and uniformly smaller than the typical variety, as detailed by Flowers (1973). A collection at RM in a packet of *Bryum lisae* var. *cuspidatum* approached the variety in the smallness of the capsules, except no spores were larger than 17 to 18 μm . The capsules were green and not furrowed. Since the operculum had dehisced and the spores appeared normal, one might assume the capsules were mature: *Nelson 1538* (RM), Albany Co. Cummins, Jul 30 1895, with *Hennediella heimii* and *Bryum lisae* var. *cuspidatum*.

Funaria hygrometrica var. *calvescens* (Schwaegr.) Mont. “seems to be a tropical expression of the species although it is known from a few southern states in the United States” (Miller & Miller, FNA Vol. 27, 2007).

GEMMABRYUM J.R. Spence & H.P. Ramsay, *Phytologia* 87: 63. 2005. (Bryaceae)

Gemmabryum caespiticium (Hedw.) J.R. Spence, *Phytologia* 91: 497. 2009.

Bryum caespiticium Hedw., Sp. Musc. Frond. 180. 1801.

Bryum julaceum Kindb.

Bryum microcephalum Müll. Hal. & Kindb. in Macoun

Bryum oligochloron Müll. Hal. & Kindb. in Macoun

Bryum synoicoaespiticium Müll. Hal. & Kindb. in Macoun

Bryum vancouveriense Kindb. in Macoun

Ptychostomum imbricatum (Müll. Hal.) D.T. Holyoak & N. Pederson

Wyoming (FNA Vol. 28, 2014). (As *Bryum caespiticium*): Wyoming: Yellowstone Natl Park, c.fr., (1516, 1519) (Roell 1893). (All as *Bryum caespiticium*) Widespread, almost cosmopolitan. Albany, Carbon Co., Uinta, Yellowstone Natl Park, Porter (1935). Teton Co., Spence (1985). Campbell Co., Medina (1994).

Albany Co.: S bank of Little Brooklyn Lake, Medicine Bow Mtns., 10,300 ft, *Schriever 17* (RM); (as *Bryum provinciale* Philib.) Medicine Bow Mtns., *Nelson 7814*, (RM, US); Cummins, with *Hennediella heimii* and *Funaria hygrometrica*, 30 Jul 1895, *Nelson 1538*, see Porter citation of this specimen below, c.fr. (RM). BIG HORN CO.: Big Horn Mtns., large rock outcrop, 9200 ft, c.fr., indehisced operculate, 9 Jul 1979, *Nelson 3332* (BUF, RM), with *Bryoerythrophyllum recurvirostrum*. Carbon Co.: Pedro Mts., *Goodding 115* (RM, US); Plants of Wyoming, Bridger Peak, *Goodding 1966* of the exsiccata, det. by Holz. (as *B. occidentale* Sull.) (RM, US). Fremont Co.: Bridger-Teton Natl Forest on US 26 & US 287, between Moran & Dubois, ca. 9000 ft, wet with flowing streams, granite outcrops, N slopes of knoll, with *Tortula ruralis*, *Encalypta vulgaris* var. *rhabdocarpa*, *Eckel 93081102*, c.fr. (BUF). Sublette Co.: 7950 ft, *Hermann 25344* (RM). Uinta Co.: Fort Bridger, 8 Jun 1898 (young), *Nelson 4595* (RM); Evanston, on dry ground, 8 Jul 1942, *Degener 17074*, c.fr. (US). Yellowstone Natl Park: Yellowstone Lake, in a wet draw, 23 Aug 1899, *Nelson 6640* (RM, US); Blacktail Deer Creek, on ground, 1 Aug 1888, *Knowlton, s.n.* (US).

Smith (1978) gives a good illustration of the abruptly acuminate apex. Note that this character is evident at least on some of the leaves (otherwise this is not definitely demonstrable). In the Big Horn Co. specimen, this species was growing with *Bryoerythrophyllum recurvirostrum* in a harsh habitat. Both taxa were capable of growing from robust in size down to tiny buttons in the sand—I have not found *Bryum lisae* var. *cuspidatum*, the other weedy taxon so like *B. caespiticium*, to be capable of this diminution of size. The *Bryoerythrophyllum* can also become very small. Another specimen from Big Horn Co. shows that this taxon, when depauperate, has a short, ropy habit with a gristled appearance, like the stem tips are little curling steel wires. In fruit, the fertile stem is a bulb in the sand, the innovations on red stalks with bulblike leaf-wrap. The colors are a Christmas red and green. It seems most of the weedy things I've been looking at are synoicous—this one is refreshingly dioicous. Its costa is significantly longer than the other weedy things. It has a weak border.

More robust specimens are different, unfortunately, but the stem is usually shorter (under 1 cm) than the run of common Bryums. I find the leaf cells can be quite thick. Crum gives an excellent description of this plant—the operculum can be quite apiculate with a prominent nipple at the tip. Note that the description of *B. caespitosum* with linear cells in the apex is a characteristic of the

sterile stems: the fertile ones have shorter cells and shorter awns (is this also true in *Rosulabryum capillare*). (Both *B. caespitosum* and *B. lisae* may have bright orange setae.) The specimen of Goodding 1966 seen from both RM and US had numerous small innovations that might be taken as bulbils. One might usually expect innovations as branchings but in Goodding's specimens they appeared to be free and developing from rhizoids or generally unattached or readily deciduous from any main stem (cf. *B. canariense*: “with short axillary branches becoming detached and acting as asexual reproductive structures). These apparent branchlets are in fact stems and may carry the male organs: in *B. pallescens*, the side axes are actually branches, without rhizoids, and so the plant is autoicous (*B. caespitosa* is dioicous). The leaves of sterile stems all had regularly excurrent costae, just as those of the fertile stems. The capsules were variable from under 2 mm to nearly three mm, none of them red—characters not associated with *Gemmabryum dichotomum* (see below). Note the variability of the capsule sizes, as recognized in Flower's description of the species, from below 1 to 3 mm.

Gemmabryum dichotomum (Hedw.) J.R. Spence & H.P. Ramsay, *Phytologia* 87: 66. 2005.
Bryum dichotomum Hedw., *Sp. Musc. Frond.* 183, plate 42, figs. 8–12. 1801.
Bryum bicolor Dickson
Gemmabryum bicolor (Dickson) J.R. Spence

Not reported for Wyoming in FNA (FNA Vol. 28, 2014), but widespread, occurring in the western states. (As *Bryum dichotomum*) Teton Co., Spence (1985).

GRIMMIA Hedw., *Sp. Musc. Frond.*, 75. 1801. (Grimmiaceae)
Drytodon Brid.; *Hydrogrimmia* (I. Hagen) Loeske

Grimmia affinis Hornsch. = *Grimmia longirostris* Hook.

Grimmia agassizii (Sull. & Lesq. in Sull.) A. Jaeg. = *Schistidium agassizii* Sull. & Lesq.

Grimmia alpestris (Weber & Mohr) Schleicher, *Cat. Pl. Helv.* ed. 2, 29. 1808.
Trichostomum pulvinatum var. *alpestre* Weber & Mohr, *Bot. Taschenbuch*, 110. 1807.
Grimmia donniana var. *alpestris* (Weber & Mohr) Hampe

Wyoming (FNA Vol. 27, Vol. 27).

Grimmia alpicola Hedw. = *Schistidium agassizii* Sull. & Lesq.

Grimmia alpicola auct. Amer. = *Schistidium rivulare* (Brid.) Podp.

Grimmia alpicola var. *latifolia* (Zett.) Mill. = *Schistidium rivulare* (Brid.) Podp.

Grimmia anodon P. Bruch & Schimp., *Bryol. Europ.* 3: 110. 1845.
Grimmia anodon var. *anomala* Bartr.
Grimmia subanodon Ochyra
Schistidium anodon (B.S.G.) Loeske
Schistidium obtusifolium Ireland & H.A. Crum

Wyoming (FNA Vol. 27, 2007). In all states and provinces of the P. Nw.; Yukon, Cal., Ariz. N.M, Nev., Utah, Colo., N. Dakota. Telephone Canyon, Albany Co. (*Porter 1014*); Long Canyon, Albany Co (*Rollins 61*), Porter (1935). Yellowstone/Teton localities are given in a map by Ireland & Miller (1982). Campbell Co., Medina (1994). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: Laramie Mtns, Roger Canyon, ca. 8 air mi NE of Laramie, Co. Rd. 17, limestone outcrops with *Cercocarpus montanus*, 7 Jun 1993, *Buck 23169* (NY); 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* (LAF) with *Orthotrichum hallii*; Laramie Mountains, Roger Canyon, 7 air mi NE of Laramie city center, limestone outcrops with *Cercocarpus montanus*, *Artemisia cava*, *A. tripartita*, *A. nova*, *A. tridentata*, on thin soil over bedrock, 7 Jun 1993, *Miller 10,234* (NYS); crevices in quartz boulder on open slope above University of Wyoming Science Camp, 9800 ft, Medicine Bow Mtns., 7.8 mi NW of Centennial, 1 Sep 1970, *Hermann 23426* (RM). Fremont Co.: on limestone outcrop, Douglas fir slope, 1/2 mi E of Horse Creek Campground, 7800 ft, Absaroka Range, 11 mi N of Dubois, 28 Aug 1973, *Hermann 25531* (RM). Platte Co.: *Eckel 1020386* (RM).

Grimmia anomala Hampe in W.P. Schimper, Syn. Musc. Eur. ed. 2, 270. 1876.

Dryptodon anomalus (Hampe) Loeske

Grimmia anomala Hampe in Schimp.

Grimmia elatior subsp. *anomala* (Hampe) Kindb.

Grimmia hartmanii var. *anomala* (Hampe) Mönk.

Grimmia pachyneurula Müller Hal & Kindb.

Grimmia philibertiana Britt.

Grimmia phyllantha Lindb. in Broth.

Wyoming (FNA Vol. 27, 2007). British Co., Wash., Alberta, Idaho, Mont., Wyoming; Michigan. Teton Co., Spence (1985).

Grimmia apocarpa Hedw. = *Schistidium apocarpum* (Hedw.) P. Bruch & Schimp. in B.S.G.

Grimmia apocarpa var. *conferta* (Funck) Spreng. = *Schistidium apocarpum* (Hedw.) P. Bruch & Schimp. in B.S.G.

Grimmia apocarpa var. *stricta* (Turn.) Hook. & Tayl. = *Schistidium apocarpum* (Hedw.) P. Bruch & Schimp. in B.S.G.

Grimmia atricha Müll. Hal. & Kindb. in Macoun & Kindb. = *Schistidium apocarpum* (Hedw.) P. Bruch & Schimp. in B.S.G.

Grimmia calyptrata Hook. in Drumm. = *Coscinodon calyptratus* (Hook. in Drumm.) C.E.O. Jens. ex Kindb.

Grimmia donniana Smith in J. E. Smith et al., Engl. Bot. 18: plate 1259. 1804.

Wyoming (FNA Vol. 27, 2007). “*Grimmia donniana* is widespread but relatively uncommon and sporadic along the front ranges of the Rocky Mountains from Alberta south to southern Utah and Colorado” (Hastings & Greven in FNA Vol. 27, 2007). Johnson Co., Porter (1937). Uinta Co., Wynne (1943).

Grimmia dupretii Thér. = *Schistidium dupretii* (Thér.) Weber

Grimmia elatior Bruch ex Balsamo-Crivelli & De Not., Mem. Reale Accad. Sci. Torino 40: 340. 1838.

Dryptodon incurvus (Hornsch.) Brid.

Grimmia cognata Card. & Thér.

Grimmia elatior subsp. *rufescens* Kindb.
Grimmia funalis var. *robusta* De. Not.
Grimmia grandis Kindb.
Grimmia papillosa (Warnst.) Kindb.
Rhacomitrium incurvum (Hornsch.) Hüb.
Trichostomum incurvum Hornsch.

Wyoming (FNA Vol. 27, 2007). British Columbia, Mont., Wyoming; Colo. Teton Co., Spence (1985). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: 7800 ft, *Hermann* 25924 (RM). Park Co.: 3250 m, 21 Aug 1973, *Weber s.n.* (COLO). Teton Co.: 7000 ft, *Hermann* 25553 (RM).

[*Grimmia funalis* (Schwägr.) P. Bruch & Schimp., Bryol. Europ. 3: 119, fig. 247. 1845, excluded]

Not reported for Wyoming by FNA (FNA Vol. 27, 2007) where the distribution is north-south from above the Arctic Circle south to Louisiana in a line of less than 10 sites. Wyoming: Yellowstone Natl Park, Upper Falls (1478) (Roell 1893).

Grimmia hartmanii var. *anomala* (Hampe ex Schimp.) Mönk. = *Grimmia anomala* Hampe ex Schimp.

Grimmia laevigata (Brid.) Brid., Bryol. Univ. 1: 183. 1826.

Campylopus laevigatus Brid., Muscol. Recent., suppl. 4: 76. 1818.
Grimmia campestris Burchell ex Hook.
Grimmia glauca Card.
Grimmia leucophaea Grev.
Grimmia sarcocalyx Kindb. in Macoun

Wyoming (FNA Vol. 27, 2007). Wash., Oregon, Idaho, Wyoming; Cal. Nev., Utah, Ariz, N. Mexico; widespread in the midwest and in the eastern states from NY to New Jersey to Fla.

Grimmia glauca Card. from Albany Co., Porter (1937) may be a citation of *G. laevigata* following Crum and Anderson's (1981: 424) synonymy: *G. glauca* sensu Jones in Grout, Moss Fl. Amer., Vol. 2(1), p. 24 1940, non Card. 1905. (As *Grimmia glauca* Card.) "A rare plant, this being one of the four known collections in the United States. On metamorphosed limestone rocks, Long Canyon, Albany County (Rollins, 60)," Porter (1935).

Grimmia longirostris Hook., Musci Exot. 1: plate 62. 1818.

Grimmia affinis Hornsch.
Grimmia arctophila subsp. *labradorica* Kindb.
Grimmia catalinensis Bartr.
Grimmia catalinensis var. *mutica* Bartr.
Grimmia elata Kindb.
Grimmia ortholoma Kindb.
Grimmia ovalis var. *affinis* (Hornsch.) Broth.
Grimmia ovata var. *affinis* (Hornsch.) P. Bruch & Schimp.
Grimmia ovateformis (sic) Kindb.

(As *Grimmia affinis*) British Columbia, Washington, Alberta, Idaho, Montana, Wyoming; Alaska, Colorado, Arizona, New Mexico; South Dakota, Minnesota. Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

(All as *Grimmia affinis*) Albany Co.: *Nelson 5243* (RM). Sublette Co.: on shaded boulder under spruce on W shore of Lower Green River Lake, 7950 ft, Wind River Range, 50 mi N of Pinedale, 19 Jun 1973, *Hermann 25323* (RM). Yellowstone Natl Park: *Bartley & Pontious 13* (RM).

The specimen *Hermann 25323* looked like *G. ovalis* (long basal cells, sinuose median cells, moderately toothed hairpoint) but it keyed to *G. affinis* (second reference in Lawton's 1971 key) through the keeled leaves recurved on one side. This species is difficult to distinguish from *Grimmia pulvinata* except it has a straight seta and that of the latter is arcuate (at least when moist, as they say). *Grimmia affinis* has basal cells that are not "subquadrate to short rectangular" but longer, getting shorter toward the margins and thinner-walled. Both are variably thick-sinuose—these characters are best seen in older leaves. *Grimmia affinis* has occasional "subcuculate" calyptrae, otherwise both are mitrate. The basal cells of *Grimmia pulvinata* are rather homogeneously thin-walled, that of *G. affinis* variable: longer and thicker toward the costa becoming shorter and thinner on the margins. Both with thickened cross-walls on the marginal two or three lengths of cells. Bistratose patches occur on the lamina, in addition to bistratose margins.

Grimmia montana P. Bruch & Schimp., Bryol. Europ. 3. 128. 1845.

Grimmia arctophila Kindb.

Grimmia brachydon Aust.

Grimmia jamesii Aust.

Grimmia montana var. *brachydon* (Austin) Lesq. & James

Grimmia montana var. *idahensis* Ren. & Card. in Card. & Thér.

Grimmia pseudomontana Card. & Thér.

Grimmia tenella Müll. Hal.

Guembelia montana (B.S.G) Hampe in Müll. Hal.

Wyoming (FNA Vol. 27, 2007). Wyoming: Yellowstone Natl Park 7000 ft, (*1467*), Lower Geyser (*1462, 1465*) Upper Falls (*1464, 1471*) (Roell 1893). Albany County (Porter 1011); Sublette County (Porter 1125 & 1127); Teton County (Porter 1171); and Tower Falls, Yellowstone Natl Park (collector unknown), Porter 1935. Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: 8000 ft, *Hermann 17721* (RM). Park Co.: 7500 ft, *Hermann s.n.* (RM).

Grimmia occidentalis Lawton = *Schistidium occidentale* (Lawton) Churchill

Grimmia ovalis (Hedw.) Lindb., Acta Soc. Sci. Fenn. 10: 75. 1871.

Dicranum ovale Hedw., Sp. Musc. Frond., 140. 1801.

Grimmia commutata Hüb.

Grimmia ovata Web. & Mohr

Grimmia ovata var. *gracilis* Röhl

Wyoming (FNA Vol. 27, 2007).

(As *Grimmia ovata*) Wyoming: Yellowstone Natl Park, Upper Falls (*1459*) (Roell 1893). B.C., Wash., Idaho, Mont., Wyoming; Nev. Ariz. (As *Grimmia commutata*) Brooklyn Lake, Albany County (*Nelson 5243*); near Pinedale, Sublette Co. (*Porter 1126*), (as *Grimmia ovalis*: Teton cos., Yellowstone Natl Park), Porter (1935). Teton Co., Spence (1985).

Albany Co.: Sheep Mt., on dry cliffs, *Goodding 2101* (RM), exsiccata Plants of Wyoming. Platte Co.: *Eckel 1420386* (RH, BUF).

Grimmia plagiopodia Hedw., Sp. Musc. Frond., 78, plate 15, figs. 6–13. 1801.

Grimmia brandegeei Aust.

Grimmia obtusa Brid.

Schistidium plagiopodium (Hedw.) Loeske

Wyoming (FNA Vol. 27, 2007). B.C., Oregon, Alberta, Mont., Wyoming; Ariz., New Mex., Colo.; S. Dakota, Iowa, Ohio, Maryland. Sweetwater Co., Weston Co., Wynne (1943).

Niobrara Co.: 4000 ft, *Hermann* 25355 (RM). Weston Co.: *Eckel* 823686 (RM, BUF).

Grimmia pulvinata (Hedw.) Smith in J. E. Smith et al., Engl. Bot. 24: plate 1728. 1807.

Fissidens pulvinatus Hedw., Sp. Musc. Frond., 158, plate 40, figs. 1–3. 1801

Campylopus pulvinatus (Hedw.) Brid.

Dryptodon pulvinatus (Hedw.) Brid.

Fissidens pulvinatus Hedw.

Grimmia decipiens var. *hendersonii* (Ren. & Card.) Sayre

Grimmia hendersoni Ren. & Card.

Grimmia indianensis (Sayre) Crum

Grimmia subcurvula Kindb.

Grimmia trichophylla var. *indianensis* Sayre

Wyoming (FNA Vol. 27, 2007). In all states and prov. of the Pacific Northwest; Cal., Nev., Utah, Ariz.; TX, Iowa, Missouri, Maryland. Carbon Co., Wynne (1943). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: 8700, *Hermann* 24863 (RM). Park Co.: granite outcrop along road ca. 11 mi SE of Rte. 212, Shoshone Natl. Forest, 33 mi NW of Cody, 19 Jul 1965, *Hermann* 20025 (RM). Johnson Co.: on the rocks in the shade of pines, Middle Fork of Powder River, 16 Jul 1901, *Goodding* 263 (RM).

The setae are arcuate when dry—a plant of specimen *Hermann* 20025 developed a straight seta on drying. The awns are conspicuously long, as long as the leaves, and the basal cells rather thin to hyaline and not at all or somewhat sinuose. There is a var. *africana* (Hedw.) Hook.f. in the 1990 checklist. See *Grimmia affinis* for discussion with regard to its distinction from this species.

Grimmia tenera Zett. = *Schistidium tenerum* (Zett.) Nyh.

Grimmia sessitana De Not., Atti Reale Univ. Genova 1: 704. 1869.

Grimmia alpestris (Web. & Mohr) Schleich. ex Hornsch. var. *alpestris*

Grimmia subpapillinervis Kindb.

Grimmia tenerrima Ren. & Card.

Guembelia alpestris (Web. & Mohr) Hampe in Müll. Hal.

Trichostomum pulvinatum var. *alpestris* Web. & Mohr

(As *Grimmia tenerrima*) In all states and provinces of the Pacific Northwest; California, Arizona, Nevada, Utah, Colorado; Labrador, Quebec. (As *Grimmia alpestris* Schleich.) Fairly common. Albany, Big Horn, Sublette, Sweetwater, Teton (& Washakie) cos., Porter (1935). (As *Grimmia alpestris*) “Common in front of glaciers,” Teton Range, Grand Teton Natl Park, Wyoming, (Spence 1981).

(All as *Grimmia tenerrima*) Albany Co.: Medicine Bow Mts., Silver Lake, growing on granitic boulder in open area, infrequent, 9000 ft, 24 Sep 1977, *Lichvar 1338* (RM). Fremont Co.: soil pocket on boulder in open woods on slope, W shore of Fiddler's Lake (Wyo. Rte 131), 9300 ft, 22 mi SSW of Lander, 18 Jun 1973, *Hermann 25296* (RM). Lincoln Co.: on granite boulder on slope above Salt River, Silver Stream Motel, 6000 ft, 11 mi N of Ashton, 11 Aug 1962, *Hermann 17842* (RM). Platte Co.: *Eckel 920386* (RH), according to a det. by McIntosh. Sublette Co.: on boulder in open spruce-pine woods, W shore of Lower Green River Lake, Wind River Range, 7850 ft., 50 mi N of Pinedale, 19 Jun 1973, *Hermann 25315* (RM); South Fork of Baldy Creek headwaters, 10,290 ft, on damp rock at edge of fen, 42°59'N, 109°34'W, with *Didymodon umbrosus*, 16 Aug 1989, *Andrus 7833a* (BING, BUF)

(As *Grimmia tenerrima*) *Grimmia sessitana* is of the smaller group of *Grimmias*, dark with awns that are frequently decurrent along the lamina at the apex of the leaf. What is very striking are the basal margin cells, quadrate with thicker crosswalls than the longitudinal walls. They have two layers of cells at the apex, double layers at the margins medially with patches of bistratose lamina. It is useful to make cross Sect.s of these leaves to verify they are not recurved, but only have thickened marginal cells due to several layers of cells. The leaves are keeled toward the leaf tips in many leaves—other leaves lie flat. *Grimmia sessitana* is “our most common species of *Grimmia* in the higher mountains of Utah” according to Flowers (1973), and it is usually sterile, which is somewhat unusual in a *Grimmia*, so if you have extensive material in your specimen and it is sterile, check to see if it is glaucous, that is, if it has a bluish cast. It has hairpoints and is dioicous. The costa is terete in the sense that it is well set off from (not confluent with) the lamina), but is somewhat flattened in longitudinal axis. There is a sharp little groove on the topside of the costa, and this can be seen on the leaves lying flat up at you: the costa is nested in a channel. The leaves are keeled.

Grimmia tenerrima Ren. & Card. = *Grimmia sessitana* DeNotaris

Grimmia torquata Drumm., *Musc. Scot.* 2: no. 28. 1825.

Dryptodon torquatus (Hornsch.) Brid.

Grimmia pellucida Kindb.

Grimmia prolifera Müll. Hal. & Kindb. in Macoun

Grimmia pseudotorquata Kindb.

Grimmia tortifolia Kindb.

Wyoming (FNA Vol. 27, 2007). In all states and prov. of the Pacific Northwest; Alaska, Cal., Nev., Colo., Ontario, Greenland. (As *Grimmia torquata* Hornsch. Fruiting plants were collected in Wyoming by Roell in 1893, Yellowstone Natl Park, 7000 ft (*Roell 1439* p.p., 1440 p.p.) “the specimen from Yellowstone has only a single tall capsule” (Roell 1893), Porter (1937.)

Sublette Co.: 10,348 ft, *Rolston 85133* (CSU).

There is a var. *flettii* (Holz.) Vaar. in Anderson et al. (1990) checklist.

Grimmia trichophylla Grev., *Fl. Edin.*, 235. 1824.

Dryptodon trichophyllus (Grev.) Brid.

Grimmia californica Sull. in Whipple

Grimmia canadensis Kindb.

Grimmia cognata Card. & Thér.

Grimmia densa Kindb. in Macoun

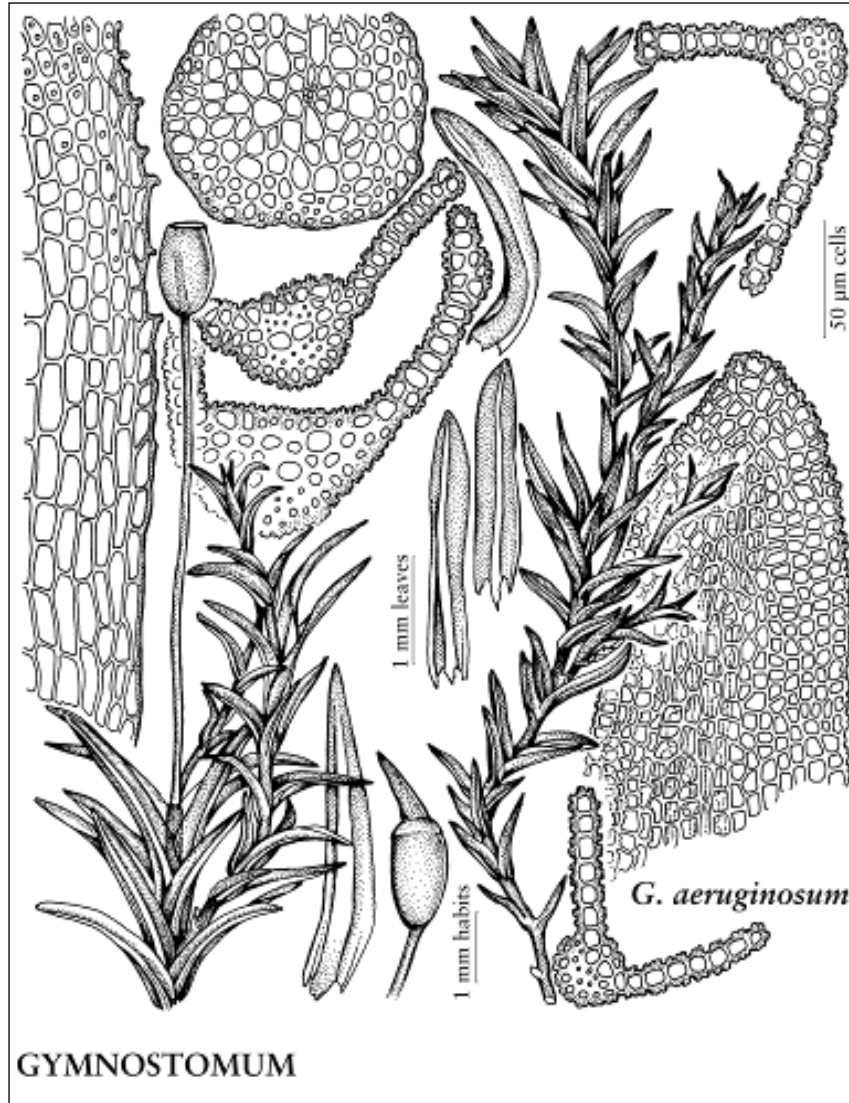
Grimmia depilata Kindb. in Macoun

Grimmia leibergii Paris

Grimmia pachyphylla Leib.

Wyoming (FNA Vol. 27, 2007). B.C., Wash., Oregon, Idaho, Mont., Wyoming; Cal. Nev. Hawk's Ranch, Albany County (Nelson in 1930), (Johnson Co.); Jenny Lake, Teton County (*Porter 1206*), Porter (1937). Teton Co., Spence (1985).

Grimmia wrightii (Sull.) Aust. = *Jaffueliobryum wrightii* (Sull. in Gray) Thér.



Courtesy FNA Association, FNA 27, 2007

GYMNOSTOMUM Nees & Hornschuch in C. G. D. Nees et al., *Bryol. Germ.* 1: 112. 1823, name conserved. (Pottiaceae)

Gymnostomum aeruginosum Smith, *Fl. Brit.* 3: 1163. 1804.

Anoetangium arizonicum Bartram

Gymnostomum clintonii Aust.

Gymnostomum rupestre Schleich. ex Schwaegr.

Gymnostomum tophaceum Aust.

Weisia rupestris (Schwaegr.) Müll. Hal.

Wyoming (FNA Vol. 27, 2007). In all states and provinces of the Pacific Northwest but not common; Alaska, California, Nevada, Arizona; Minnesota, Iowa, Wisconsin, Michigan, Ontario; Quebec, New York, Ohio, Pennsylvania, Tennessee.

Big Horn Co.: 8800 ft, *Hartman & Odasz 9146* (RM). Park Co.: 2324–2350 m, *Duell 2269.4* (BUF). Washakie Co.: on limestone boulders in a shady canyon, Ten Sleep Canyon, Big Horn Mts. 8000 ft, 9 Sep 1935, *Porter 2094*. Yellowstone Natl Park: near Gardner River, 16 Aug 1953, *Lawton 1819* (WTU).

[*Gymnostomum calcareum* Nees & Hornsch. in Nees et al., excluded]

Not reported for Wyoming by FNA (FNA Vol. 27, 2007) and probably not found there.

Washakie Co., Porter (1937). Probably *Gymnostomum aeruginosum*, v. discussion in Crum & Anderson (1981: 285). North American citations are perhaps juvenile forms of *G. aeruginosum*. This species occurs, however, in southern California. The specimen from WTU of *Porter 2094*, “On limestone boulders in a shady canyon” from the Ten Sleep Canyon in the Big Horn Mts, Washakie Co.: has been determined to be *Gymnostomum aeruginosum* by R. Zander. The specimen in Sect. shows a ventral costal epidermis, two stereid bands, and a central strand in the stem. The capsules were young and so rather ovoid.

Gymnostomum curvirostre Hedw. ex Brid. = *Hymenostylium recurvirostre* (Hedw.) Dix.

HEDWIGIA P.-Beauv., Mag. Encycl. 5: 304. 1804, name conserved. (Hedwigiaceae)

Hedwigia ciliata (Hedw.) P.-Beauvois, Prodr. Aethéogam., 15. 1805.

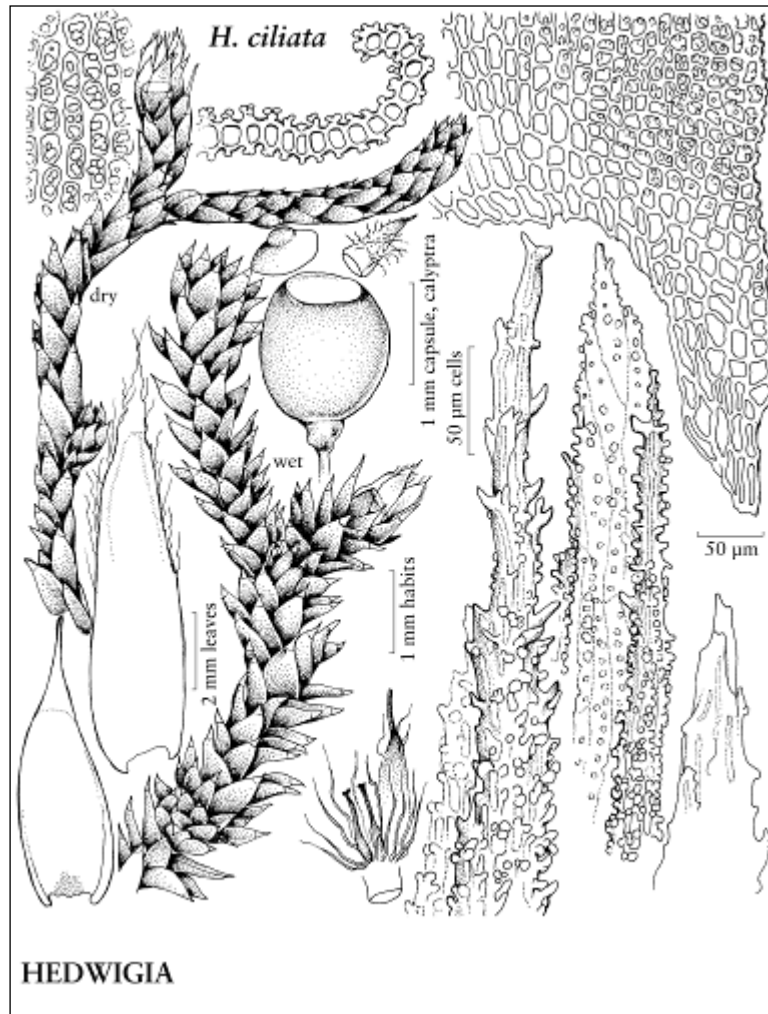
Anictangium ciliatum Hedw., Sp. Musc. Frond., 40. 1801.

Hedwigia ciliata subsp. *subnuda* Kindb.

Wyoming (FNA Vol. 28, 2014). Hawk's Ranch, Albany County (*Nelson 7500*). This plant is very common just to the south, entering Wyoming only at the extreme southern edge, Porter (1937).

Crook Co.: 4350 feet, *Porter 1676* (RM, BUF).

Helodium blandowii F. Weber & D. Mohr = *Elodium blandowii* (F. Weber & D. Mohr) Eckel



Courtesy FNA Association, FNA 28, 2014

HENNEDIELLA Paris, Actes Soc. Linn. Bordeaux, sér. 5, 9: 232. 1895. (Pottiaceae)

Hennedia R. Brown bis, Trans. & Proc. New Zealand Inst. 25: 285. 1893, not *Hennedyia* Harvey 1855.

Hennediella heimii (Hedw.) R.H. Zander, Bull. Buffalo Soc. Nat. Sci. 32: 248. 1993.

Gymnostomum heimii Hedw., Sp. Musc. Frond., 32. 1801.

Desmatodon heimii (Hedw.) Mitt.

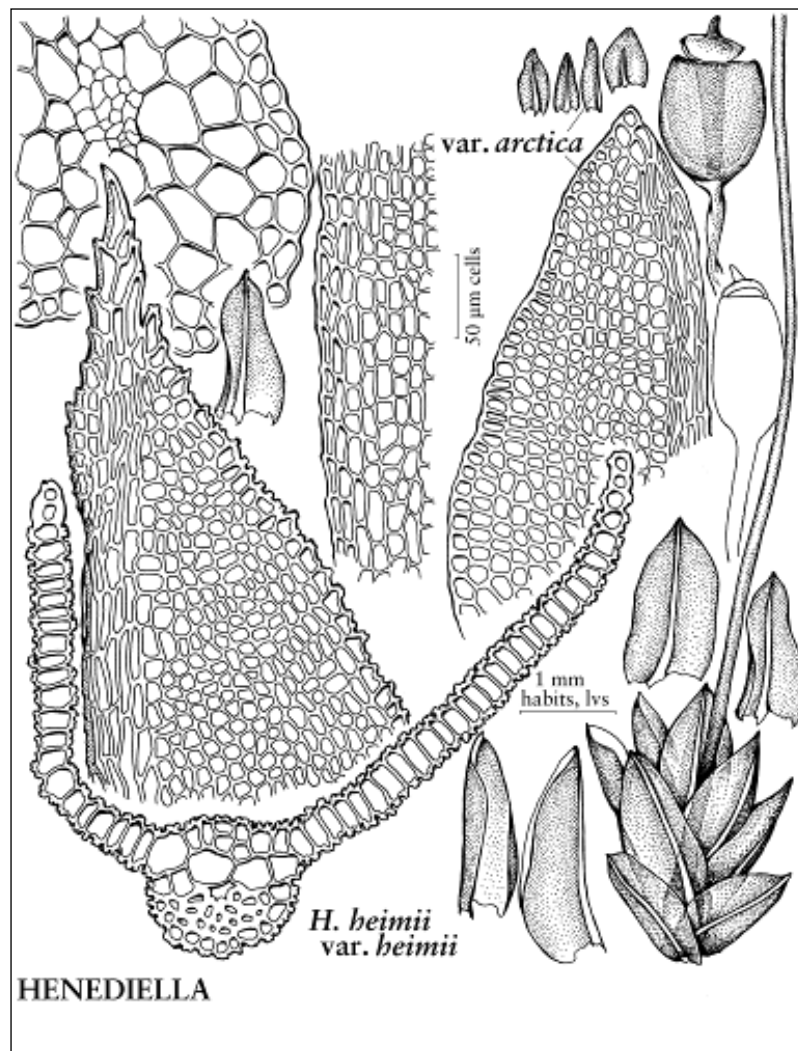
Pottia heimii (Hedw.) Fürnr.

Pottia heimioides Kindb. in Macoun

Wyoming (FNA Vol. 27, 2007). (As *Desmatodon heimii*) British Columbia, Washington, Alberta, Idaho, Montana, Wyoming; Alaska, Yukon, California, Nevada, Utah, New Mexico, Colorado; Saskatchewan, Manitoba; Quebec, New Brunswick. (All as *Desmatodon heimii*) Antelope Basin, Albany Co. (*Nelson 7485*), (Sublette cos.), Porter (1935). (as var. *cylindrica* Br. Centennial, Albany Co. (*Nelson 7976*); Plumbago Canyon, Albany County (*Porter 490*), Porter (1935). (As *Pottia heimioides* Kindb. Centennial, Plumbago Canyon, and Libby Creek, all in Albany County; Pinedale, Sublette County, Porter (1935). ? var. *cylindrica* Br. in Porter (1935). Sublette Co.: Eckel (1985).

(All as *Desmatodon heimii*) Albany Co.: Nelson 7484b, with *Rosulabryum capillare* specimen, exsiccat (RM); Centennial, Nelson 7976 (RM); NW base of Sheep Mtn along WY 11, seep area (calcareous fen) with *Populus*, *Betula*, and *Salix*, Buck 23239 (NY); young skinny green capsules and old year, probably ripen at end of month, in packet of *Bryum caespiticium*, 7 Jun 1993, Nelson 1538 (RM); Cummins, with *Funaria hygrometrica*, ca. 4 air mi ESE of Centennial, NW base of Sheep Mountain along WY 11, 7700–7900 ft, *Populus*, *Betula*, and *Salix* associated with spring seep, on soil bank, with *Leptobryum pyriforme* and *Campylium chrysophyllum*, 7 Jun 1993, Miller 10,269 (NYS). Sweetwater Co.: ca. 6400 ft on US (187)191, at 14-Mile Reservoir picnic area in *Artemisia* scrubland, moist shaded ravine over brook, with *Leptobryum pyriforme* and *Campylium chrysophyllum*, 5 Jul 1985, Eckel 412086 (BUF, RM).

There is also a (*Desmatodon heimii*) var. *arctica* (Lindb.) Crum = *Henediella heimii* var. *arctica* (Lindb.) R.H. Zander, which is not in Wyoming (FNA Vol. 27, 2007).



Courtesy FNA Association, FNA 27, 2007

HETEROCLADIUM Schimp. in P. Bruch and W.P. Schimper, *Bryol. Europ.* 5: 151, plates 479, 480. 1852. (Pterigynandraceae)

Heterocladium dimorphum (Brid.) Schimp. in P. Bruch and W.P. Schimper, *Bryol. Europ.* 5: 153. 1852.

Hypnum dimorphum Brid., *Muscol. Recent.*, suppl. 2: 149. 1812.

Heterocladium squarrosulum (Voit) Lindb.

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

Yellowstone Natl Park: along Firehole River near Old Faithful Geyser, rotten wood, 6 Jul 1934, *Frye s.n.* (BUF).

HOMALOTHECIUM Schimp. in P. Bruch and W.P. Schimper, *Bryol. Europ.* 5: 91, plates 456, 457. 1851. (Brachytheciaceae)

Camptothecium Schimp.

Camptothecium sect. Trachybryum Broth.

Trachybryum (Broth.) W.B. Schofield

Sometimes *Brachythecium salebrosum* can be deeply and multiplicate, resembling a species of *Homalothecium*. However, all species in *Homalothecium* are dioicous. The three species of the genus in Wyoming have no (or seldom have) recurved teeth near the leaf base (although the margins may be denticulate), the basal laminal cells are in only 1–3(–5) rows (not 5–8 rows) and the distal laminal cells on the abaxial surface of the leaf are smooth (not prorate). They are regularly (not unequally) pinnate and the branch leaves, when dry, are generally appressed (not erect and somewhat spreading).

Homalothecium aeneum (Mitt.) Lawton, *Bull. Torrey Bot. Club* 92: 351. 1965.

Hypnum aeneum Mitt., *J. Linn. Soc., Bot.* 8: 31, plate 5 (lower left). 1864.

Camptothecium aeneum (Mitt.) A. Jaeg.

Camptothecium aeneum subsp. *dolosum* Ren. & Card.

Camptothecium aeneum var. *dolosum* (Ren. & Card.) Grout

Homalothecium nevadense var. *aeneum* (Mitt.) Heike Hofmann

Wyoming; “The ranges of both taxa (plus *H. nevadense*) are almost identical, although *H. aeneum* is more common in the northern part of their range and *H. nevadense* in the south. The two species are distinguished mainly by sporophytic characters, and sterile collections are usually difficult to interpret” (Ignatov, FNA Vol. 28, 2014). (As *Camptothecium*) Albany County, Carbon County, Crook County, and Yellowstone Natl Park, Porter (1935). (As *Camptothecium aeneum*) Albany, Catron, Crook, Sheridan cos., Yellowstone Natl Park, Porter (1937). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

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 1791* (BUF). Sheridan Co.: *Rollins 362* (RM). Yellowstone Natl Park: Mammoth Hot Springs, Yellowstone Park, on moist ground, *Nelson 6041*, printed label Plants of Wyoming (US, RM).

The Mammoth Springs specimen Nelson 6041 was determined by Holz. as *Camptothecium lutescens* B.&S. (= *Homalothecium fulgescens*), but I have redetermined it as *H. aeneum* based on leaves only to 2 mm, many leaves broadly acute, short capsule (endostome probably eroded) and abundant (exsiccated) material on soil, not on trees as is typical of *H. fulgescens* (Lawton).

Homalothecium aureum (Spruce) H. Robinson, Bryologist 65: 96. 1963.

Isothecium aureum Spruce, Musci Pyren., 145. 1847.

Camptothecium amesiae Ren. & Card.

Homalothecium pinnatifidum (Sull. & Lesq.) Lawton

(As *Camptothecium pinnatifidum*) Mammoth, Yellowstone Natl Park (*Smiley*), Porter (1935).
(As *Camptothecium pinnatifidum* (Sull. & Lesq.) A. Jaeg. & Sauerb). Yellowstone Natl Park, Porter (1937).

(As *Homalothecium pinnatifidum*) Sheridan Co.: moist limestone, Big Horn Natl Forest, T57N, R89W, Sect. 34, with *Ditrichum capillaceum*, *Hypnum pretense*, *McKee 92-001* (BUF, RM).

“The species can be recognized in the field by numerous, slightly curved branches that are conspicuously equal in length, and have closely julaceous foliage. The main microscopic diagnostic feature is the numerous quadrate alar cells, each relatively large, having clear outlines and only slightly incrassate walls, and arranged in rows parallel to the leaf margins.” (Ignatov in (FNA Vol. 28, 2014).

[*Homalothecium lutescens* (Hedw.) H. Robinson (synonym: *Camptothecium lutescens* (Hedw.) Schimp. in B.S.G.) is a Eurasian species (Ignatov, FNA Vol. 28, 2014), excluded]

(As *Camptothecium lutescens* (Huds.) B. & S.) Yellowstone Natl Park, Porter (1937). Excluded from the North American flora by Crum et al., 1973. (As *Camptothecium lutescens*) Mammoth Hot Springs, Yellowstone Natl Park (*Aven & Elias Nelson 6041*), Porter (1935). The specimen, upon reexamination, is apparently *Homalothecium fulgescens* (Mitt. ex Müll. Hal.) A. Jaeg..)

Homalothecium nevadense (Lesq.) Ren. & Card., Bot. Gaz. 13: 202. 1888.

Hypnum nevadense Lesq., Mem. Calif. Acad. Sci. 1: 33. 1868.

Homalothecium nevadense var. *subulatum* Ren. & Card.

Homalothecium sericeoides Müll. Hal. & Kindb. in Macoun

Wyoming (FNA Vol. 28, 2014). Campbell Co., Medina (1994). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Park Co.: granite outcrop on bank of Crandall Creek, 6500 ft, Shoshone Natl. Forest, 36 mi NW of Cody, *Hermann 20038* (US); 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 1783* (BUF).

This specimen (Elliott 20038) is identified without capsules. A sheet with several specimens of this species, none with capsules, was seen from US and identified by Lawton and Hermann. They were able to do this because *Homalothecium nevadense* is generally pinnatifid. Lawton (1971) does not mention any particular pinnate branching. The Park Co. specimen had smooth costae. Note that the basal angles were somewhat excavate and decurrent. See a great description by Flowers (1973: 455).

Homalothecium nitens (Hedw.) Robins. = *Tomentypnum nitens* (Hedw.) Loeske

Homalothecium pinnatifidum (Sull. & Lesq.) Lawton = *Homalothecium aureum* (Spruce) H. Robinson

HYGROAMBLYSTEGIUM Loeske, Moosfl. Harz., 298. 1903, name conserved. (Amblystegiaceae)

Hygroamblystegium noterophilum (Sull. & Lesq.) Warnst. = *Hygroamblystegium varium* subsp. *noterophilum* (Sull. & Lesq.) Vanderpoorten & Hedenäs

Hygroamblystegium tenax (Hedw.) Jenn. = *Hygroamblystegium varium* (Hedw.) Mönk. var. *varium*

Hygroamblystegium varium (Hedw.) Mönk., Hedwigia 50: 275. 1911 (as *Hygramblystegium*).

Leskea varia Hedw., Sp. Musc. Frond., 216, plate 53, figs. 15–20. 1801.

Amblystegium varium (Hedw.) Lindb.

Subsp. **varium** (Amblystegiaceae)

(As *Amblystegium varium*) Wyoming: Yellowstone Natl Park (1533) (Roell 1893).

(As *Amblystegium varium* (Hedw.) Lindb.) Ferris Mts., Carbon Co. (*Nelson 4979*) Porter (1935).

(As *Amblystegium varium* (Hedw.) Lindb.)

Albany Co.: 8500 ft, *Hermann 17776* (RM); Medicine Bow Mts, Medicine Bow Natl Forest, Barber Lake Picnic Area, 2.5 air mi NW of Centennial, *Pinus contorta* forest along Libby Creek, *Buck 23205* (NY).

The *Hermann 17776* specimen has decidedly serrate margins and somewhat inflated alar cells. The *Buck 23205* specimen has serrate margins, especially at the base, evidence of channeling in the acumen but with marvelously inflated excavate basal cells!

Subsp. **varium** var. **varium** (Amblystegiaceae)

Amblystegium fluviatile (Hedw.) Schimp.

Amblystegium tenax (Hedw.) C.E.O. Jensen

Amblystegium trichopodium (Schultz) Hartman

Hygroamblystegium fluviatile (Hedw.) Loeske

Hygroamblystegium humile (P.-Beauv.) Vanderpoorten, Hedenäs & Goffinet

Hygroamblystegium irrigum (Hook. & Wils. ex Wils.) Loeske

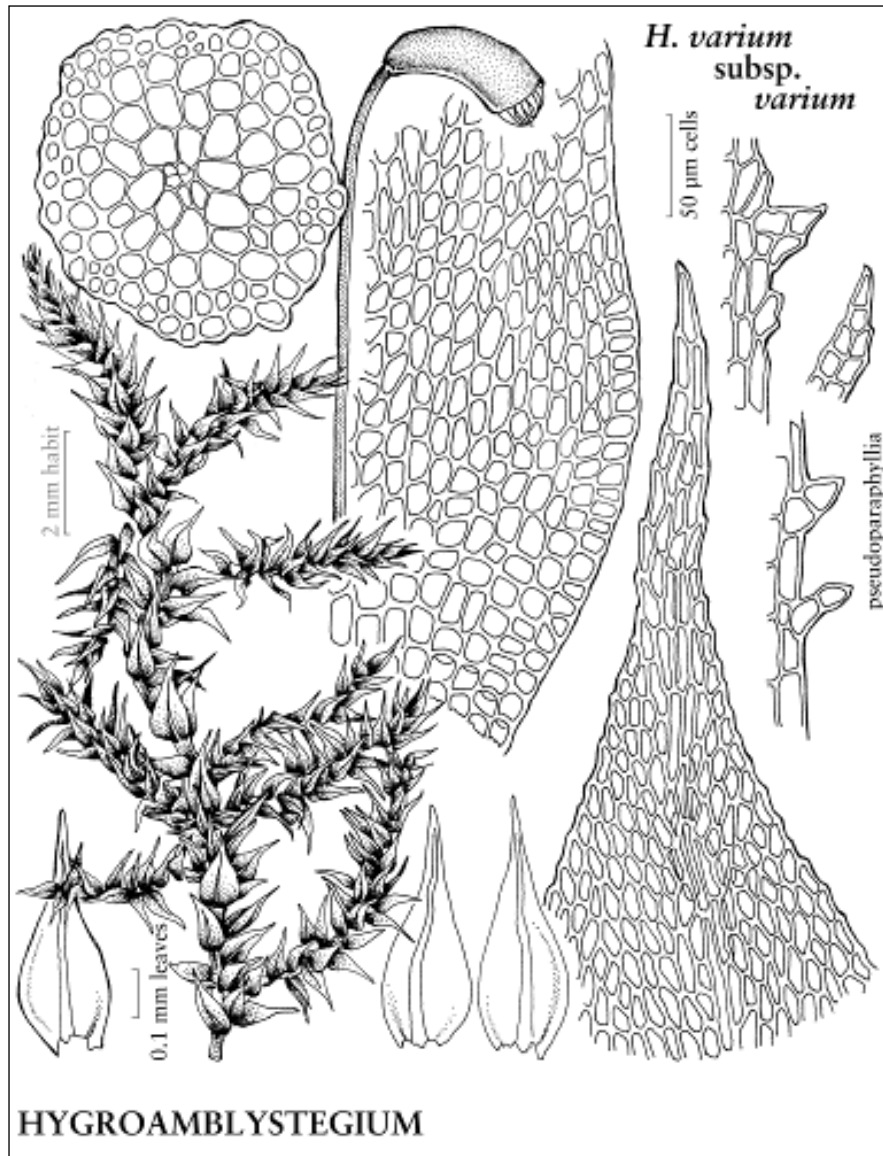
Hygroamblystegium orthocladum (P.-Beauvois) Loeske

Hygroamblystegium tenax (Hedw.) C.E.O. Jensen

Wyoming (FNA Vol. 28, 2014). (As *Hygroamblystegium irrigum*) Pole Creek, Albany County (*Porter 661*), Porter (1935). (As *Hygroamblystegium irrigum* (Wils.) Loeske) Albany Co., Porter (1937). (As *Hygroamblystegium orthocladon* (P.-Beauvois) Grout). Canyon, Yellowstone Natl Park (*Smiley*), Porter (1935). Wyoming, Crum and Anderson (1981: 927).

Lincoln Co.: 6700 ft, *Hermann 25603* (RM).

There is a var. *spinifolium* (Schimp.) Jenn. in Anderson et al. (1990) checklist (of *Hygroamblystegium tenax*).



Courtesy FNA Association, FNA 28, 2014

Subsp. **varium** var. **humile** (P.-Beauv.) Vanderpoorten & Hedenäs, J. Bryol. 31: 131. 2009.

Hypnum humile P.-Beauv., Prodr. Aethéogam., 65. 1805.

Amblystegium trichopodium (Schultz) C.J. Hartm. var. *trichopodium*

Amblystegium trichopodium (Schultz) Hartm.

Amblystegium trichopodium var. *curvipes* (Schimp. in B.S.G.) Broth.

Amblystegium trichopodium var. *kochii* (Schimp. in B.S.G.) Lindb.

Leptodictyum humile (P.-Beauv.) Ochyra

Leptodictyum trichopodium (Schultz) Warnst.

Leptodictyum trichopodium var. *curvipes* (Schimp. in B.S.G.) Broth.

Leptodictyum trichopodium var. *kochii* (Schimp. in B.S.G.) Broth.

Wyoming (FNA Vol. 28, 2014). (As *Leptodictyum trichopodium* (Schultz) Warnst. var. *kochii* (B.S.G.) Broth.) Albany, Crook cos., Porter (1935) & 1937. (As var. *kochii*) Albany Co.: Centennial Valley, Nelson 2671 (RM).

(All as *Leptodictyum humile*) Albany Co.: NW base of Sheep Mtn. along WY Rte. 11, ca. 4 mi due ESE of Centennial, ca. 7700–7800 ft, fen with low forest of *Populus*, *Betula*, *Salix* in shallow water, a “hanging bog” on steep hillside, in the bog, 7 Jun 1993, *Reese 18177* (LAF); ca. 4 air mi ESE of Centennial, NW base of Sheep Mtn, along WY 11, 7700–7900 ft, *Populus*, *Betula*, and *Salix* associated with spring seep, on log under shrubs, 7 Jun 1993, *Miller 10,264* (NYS). Crook Co.: Sundance Creek, *Nelson 2233* (RM). Sublette Co.: Bridger-Teton Natl Forest, 4.6 mi N of Bondurant on US 191 & 189, rocks, lush herbage, N slope, Hoback River valley, shaded sandstone rock, with *Saionia uncinata*, *Brachythecium salebrosum*, *Eurhynchiastrum pulchellum*, *Platydictya jungermannioides*, 5 Jul 1985, *Eckel 9612521* (BUF).

Apparently the difference between this species and *Amblystegium juratzkanum*—in forms of *trichopodium* where the costa goes only halfway up the leaf, the leaves to 1 mm—is in the character of the areolation. In *A. trichopodium* (now *Leptodictyum*, as one would guess) the leaf cells are longer, thinner walled and larger than the smaller, shorter, thicker-walled *A. juratzkanum*. There are specimens in which the leaves are identical except for the leaf cells. See the comparative areolations in Crum and Anderson (1981: 943). *Campylium hispidulum*, which is similar, differs by the more conspicuous dentition, the channeled apex, the more abruptly acuminate condition from a broader base, the more slender apex sometimes short-filiform often reflexed or bent backward. *Campylium chrysophyllum* is strongly channeled in the apex and with more strongly falcate leaf tips again more abruptly acuminate. The costa is stronger, more than 1/2 the leaf length.

Subsp. **noterophilum** (Sull. & Lesq.) Vanderpoorten & Hedenäs, J. Bryol. 31: 130. 2009.

Hypnum noterophilum Sull. & Lesq. in A. Gray, Manual ed. 2, 678. 1856.

Amblystegium fluviatile var. *noterophilum* (Sull. & Lesq.) Flowers

Amblystegium noterophilum (Sull. & Lesq.) Holz.

Hygroamblystegium noterophilum (Sull. & Lesq.) Warnst.

Wyoming (FNA Vol. 28, 2014). (As *Hygroamblystegium noterophilum* (Sulliv.) Warnst.) Albany Co., Porter (1937). (As *Hygroamblystegium noterophilum* (Sull.) Warnst.) Laramie, Albany County (*Nelson 9112*), Porter (1935).

Albany Co.: “Laramie,” *Nelson 9112* (RM).

Mentioned by Crum and Anderson (1981: 924), where Wyoming is cited, and “Attached to calcareous rocks and usually submerged in shallow, running water, in springs or small streams, often in association with *Fissidens grandifrons*, at its best development in large, upwelling calcareous springs.”

HYGROHYPNUM Lindb., Contr. Fl. Crypt. As., 277. 1873. (Amblystegiaceae)

Hygrohypnella Ignatov & Ignatova

Pseudohygrohypnum Kanda

The species of *Hygrohypnum* may be occasionally confused with those of *Drepanocladus*: look for a variable costa in *Hygrohypnum*: double in *Hygrohypnum ochraceum* with large inflated auricles and cortical cells coming off from the stem.

Hygrohypnum bestii (Ren. & Bryhn) Holz., Bryologist 4: 12. 1901.

Hypnum molle subsp. *bestii* Ren. & Bryhn, Bull. Acad. Int. Géogr. Bot. 10: 7. 1901.

Hygrohypnella bestii (Ren. & Bryhn) Ignatov & Ignatova

Hygrohypnum bestii (Ren. & Bryhn) Broth.

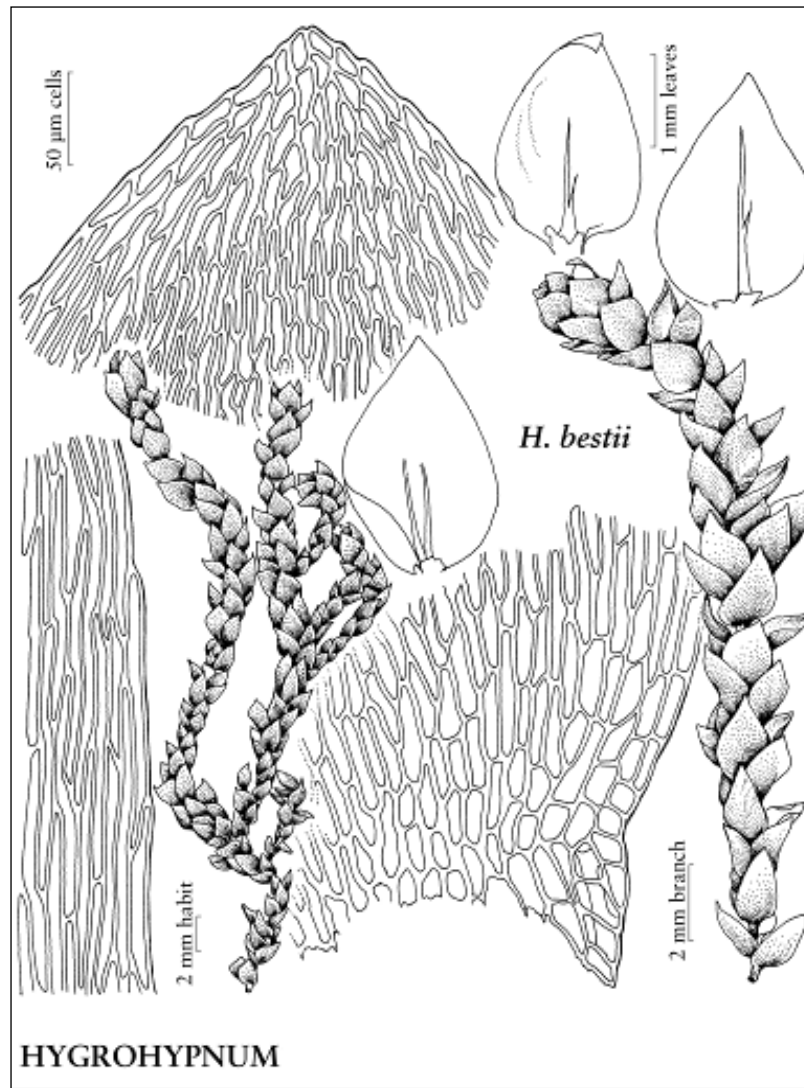
Hygrohypnum molle var. *bestii* (Ren. & Bryhn) Habeeb

Limmobium bestii (Ren. & Bryhn) Holz.

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

Fremont Co.: Dubois, westward near Tworoger Pass, 9000 ft, on ground, 22 Jun 1931 *Frye s.n.* (WTU). Park Co.: Rd from Bear Tooth Lodge to Red Lodge, E of Summit at 10,500 ft near small glacial lake, *Lawton 1972*, leaves to 2 mm (WTU). Park Co.: Falls Creek near Silver Gate, *Lawton 2118* (WTU); NW side of Bear Tooth Lake, *Lawton 2079* (WTU). Teton Co.: Teton Natl Park, Cascade Trail, 14 Aug 1953, *Lawton 1769* (WTU). Yellowstone Natl Park: Mt. Washburn, 16 Aug 1925, *Frye s.n.* (RM); Black Sand Basin, with *Bryum pseudotriquetrum*, *Calliergonella cuspidate*, 18 Aug 1953, *Lawton 1871* (WTU).

These specimens are only identified as *Hygrohypnum bestii* because some stem tips support leaves to 2 mm, but none of them by much more. Jamieson (in FNA Vol. 28, 2014) considered this a western species with some eastern disjuncts. “*Hygrohypnum bestii* is much confused in North America with *H. duriusculum* and *H. molle*; plants are readily distinguished by their diagnostically long marginal laminal cells, to 90 μm or longer” (Jamieson in FNA Vol. 28, 2014).



Courtesy FNA Association, FNA 28, 2014

Hygrohypnum dilatatum (Wils.) Loeske = *Hygrohypnum molle* (Hedw.) Loeske

Hygrohypnum duriusculum (De Not.) D.W. Jamieson, *Taxon* 29: 152. 1980.

Limnobium duriusculum De Not. in F. Ardissonne et al., *Erb. Crittog. Ital.*, ser. 2: no. 204. 1869.

Calliergon circulifolium (Müll. Hal. & Kindb.) Kindb.

Calliergon dilatatum (Wilson) Kindb.

Calliergon pseudoarcticum (Kindb.) Kindb.

Hygrohypnella duriuscula (De Not.) Ignatov & Ignatova

Hygrohypnum dilatatum (Wilson) Loeske

Hygrohypnum eugyrium var. *dilatatum* (Wilson) Grout

Hypnum circulifolium Müll. Hal. & Kindb.

Hypnum dilatatum Wilson

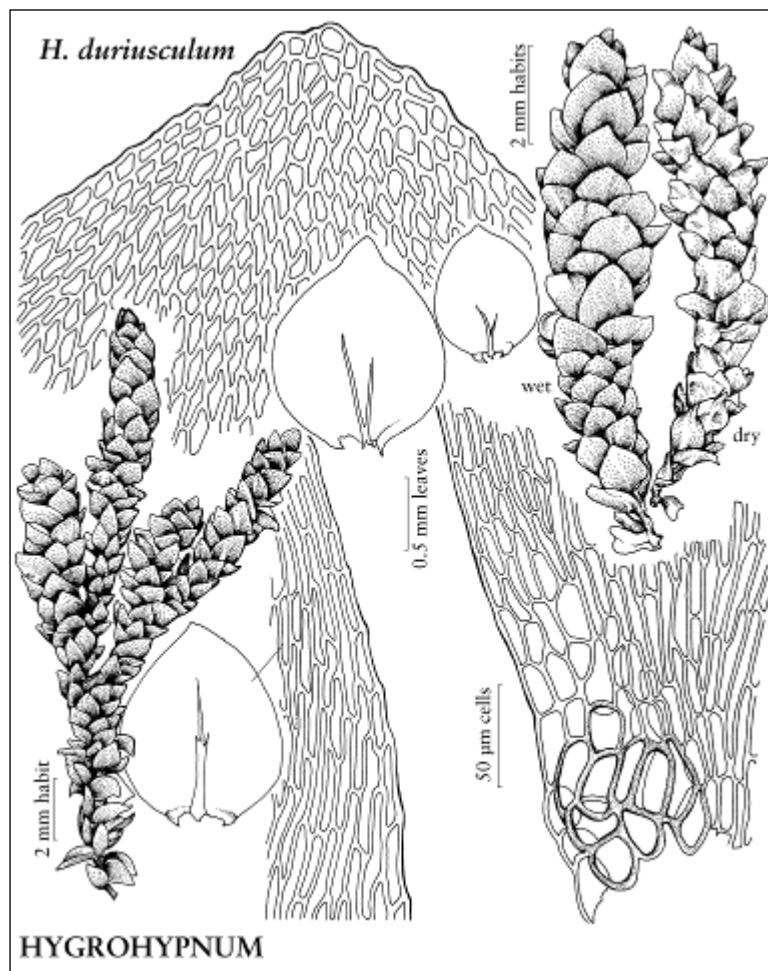
Hypnum pseudoarcticum Kindb.

Limnobium pseudoarcticum (Kindb.) Kindb.

Ochyraea duriuscula (De Not.) Ignatov & Ignatova

Wyoming (FNA Vol. 28, 2014)

(As *Hygrohypnum duriusculum*) Sublette Co.: 10,324 ft, *Rolston 85106* (CSU).



Courtesy FNA Association, FNA 28, 2014

Hygrohypnum luridum (Hedw.) Jennings, Man. Mosses W. Pennsylvania, 287. 1913.*Hypnum luridum* Hedw., Sp. Musc. Frond., 291. 1801.*Calliergon pseudomontanum* (Kindb.) Kindb.*Hygrohypnum palustre* (Hedw.) Loeske*Hygrohypnum palustre* var. *julaceum* (Schleicher ex P. Bruch & Schimp.) Loeske*Hygrohypnum palustre* var. *subsphaericarpon* (Schleicher ex Brid.) Loeske*Hygrohypnum pseudomontanum* (Kindb.) Grout*Hypnum columbicopalustre* Müll. Hal. & Kindb.*Hypnum palustre* Hudson ex Brid.*Hypnum pseudomontanum* Kindb.*Hygrohypnum palustre* Loeske, nom. illeg.*Hypnum subeugyrium* var. *occidentale* Card. & Thériot*Limnobium pseudomontanum* (Kindb.) Kindb.*Scleropodium krausei* (Müll. Hal.) Macoun & Kindb.

(As *Hygrohypnum palustre* (Huds.) Loeske. Battle Lake, Carbon County (Nelson 4202, in part); Elk Mountain, Carbon County (Gooding, 548), Porter (1935). (As *Hygrohypnum palustre* Loeske.) Carbon Co., Porter (1937). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

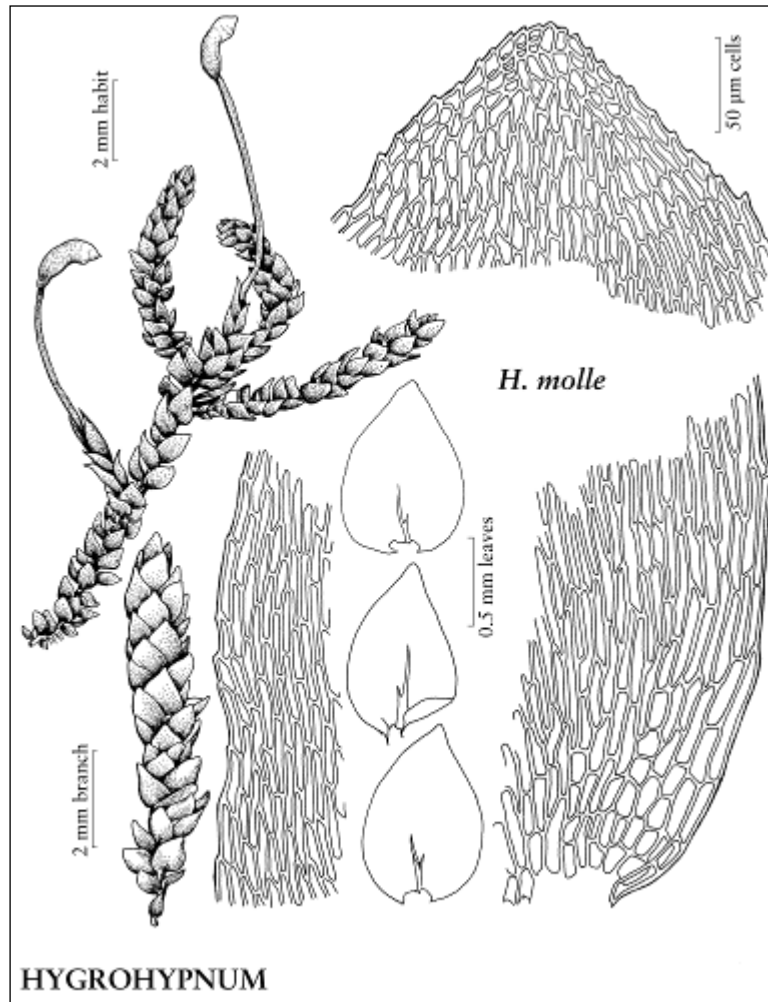
Albany Co.: Medicine Bow Mtns., Medicine Bow Natl. Forest, Barber Lake Picnic Area, 2.5 air mi NW of Centennial, *Pinus contorta* forest along Libby Creek, 2660 m, *Buck 23199* (NY); Centennial Hills, 20 Aug 1896, *Nelson 2704*. Carbon Co.: Medicine Bow Range on the Sand Lake road at Trail Creek, 9200 ft, spruce-fir zone, submerged in stream, 11 Aug 1964. *Porter 9695* (RM). Lincoln Co.: 6600 ft, stones, partially submerged, *Hermann 25592* (RM). Natrona Co.: Hat Six Falls, 7 Aug 1898, *Nelson 5038* (RM). Sublette Co.: 7950 ft, moist boulder, *Hermann 25338* (RM). Yellowstone Natl Park: wet creek-boulder, *Hermann 25769* (RM).

The plants (e.g. *Buck 23199*) do indeed manage to not be denticulate in the apex, as in *Hygrohypnum molle* and *H. bestii*. The plants are “lurid,” a sordid dark green to yellow with brown tones overall. The leaf shape is distinctive: short rice-shaped; boat or spoon shaped (concave), rather than orbiculate as in *H. molle* and *H. bestii*. The leaves are broadest across the middle. “*Hygrohypnum luridum* is the only calcicole in the genus; it occurs on calcareous rock or on other substrates irrigated with calcareous water” (Jamieson in FNA Vol. 28, 2014).

Hygrohypnum molle (Hedw.) Loeske, Moosfl. Harz., 320. 1903.*Hypnum molle* Hedw., Sp. Musc. Frond., 273, plate 70, figs. 7–10. 1801.*Calliergon molle* (Hedw.) Kindb.*Calliergon submolle* (Kindb.) Kindb.*Hygrohypnum dilatatum* (Wils.) Loeske*Hygrohypnum smithii* var. *goulardii* (Schimp.) Wijk & Marg.*Limnobium submolle* Kindb.*Ochyraea mollis* (Hedw.) Ignatov

Not reported from Wyoming in FNA (FNA Vol. 28, 2014). (As *Hygrohypnum dilatatum* (Wils.) Loeske). Carbon County and Johnson County, Porter (1935). Carbon, Fremont, Johnson, Teton cos., Yellowstone Natl Park, Porter (1937). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: University Laboratory near Centennial, *Lawton 1657*, leaves to 1.5 mm (WTU). Carbon Co.: moist soil on rocks, 10,000 ft, *Hermann 17148* (RM) Park Co.: Beartooth Plateau, snowbeds, 3200 m, *Weber B-44313* (RM, COLO). Yellowstone Natl Park: near mouth of Yellowstone Lake, 21 Jun 1931, *Frye s.n.*, leaves to 1 mm (WTU).



Courtesy FNA Association, FNA 28, 2014

Hygrohypnum ochraceum (Turner ex Wilson) Loeske, Moosfl. Harz., 321. 1903.

Hypnum ochraceum Turner ex Wilson, Bryol. Brit., 400, plate 58 (lower right).

Calliergon ochraceum (Turner ex Wilson) Kindb.

Hygrohypnella ochracea (Turner ex Wilson) Ignatov & Ignatova

Hygrohypnum ochraceum var. *filiforme* (Limpr.) J.J. Amann

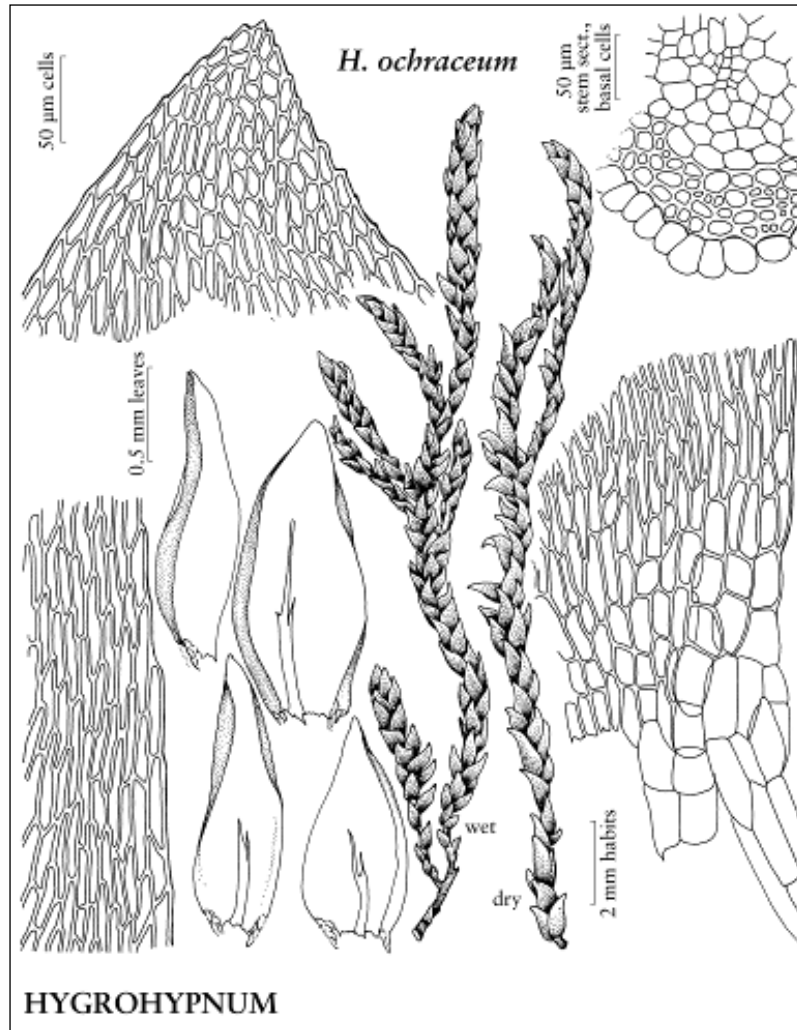
Hygrohypnum ochraceum var. *flaccidum* (Milde) J.J. Amann

Hygrohypnum ochraceum var. *uncinatum* (Milde) Loeske

Wyoming (FNA Vol. 28, 2014). (As *Hypnum ochraceum*) Wyoming: Yellowstone Natl Park (1568–69, 1572a) (Roell 1893). Pole Mt., Albany County (*Porter 1418*); Canyon, Yellowstone Natl Park (*Smiley*), Porter (1935); Yellowstone Natl Park, Porter (1937). Teton Co., Spence (1985). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Carbon Co.: 25 Jun 1931, *Frye s.n.* (RM); wet rocks on edge of stream above Lake Marie, 10,000 ft, Snowy Range, Medicine Bow Mts., ca. 13 mi E of Ryan Park, 19 Aug 1961, *Hermann 17149* (RM). Carbon Co.: 8600 ft, creek bank, *Hermann 26714* (RM). Fremont Co.: 8600 ft, partially wooded slope, *Hermann 25306* (RM); westward from Dubois, Tworoger Pass, about 9000 ft, 22 Jun 1931, *Frye s.n.* (BUF). Sublette Co.: 10,324 ft, *Rolston 85136* (CSU); 10,500 ft, *Rolston 85116* (CSU); 10,595 ft, *Rolston 85107* (CSU); 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 7792a* (BING). Yellowstone Natl Park: 7 Jul 1934, *Frye s.n.* (RM).



Courtesy FNA Association, FNA 28, 2014

Hygrohypnum smithii (Sw.) Broth. in H.G.A. Engler and K. Prantl, *Nat. Pflanzenfam.* 231(I,3): 1039. 1908.

Leskea smithii Sw. in S. Liljeblad, *Utkast Sv. Fl.* ed. 3, 549. 1816.

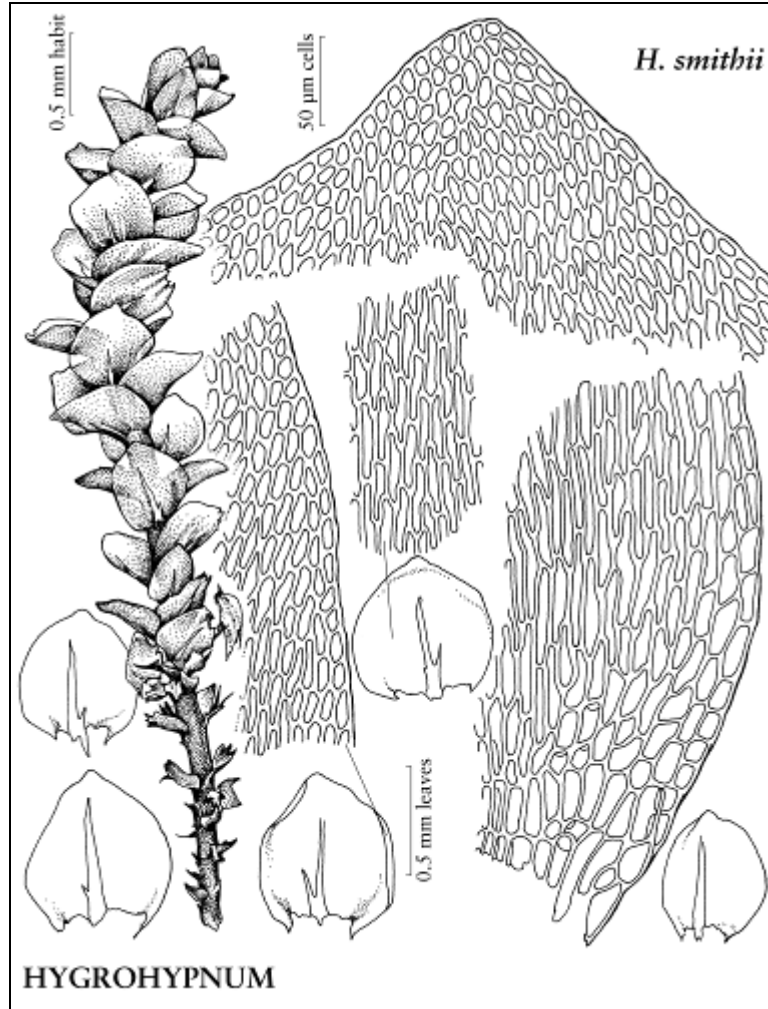
Calliergon arcticum (Sommerfelt) Kindb.

Hypnum torrentis Müll. Hal. & Kindb.

Ochyraea smithii (Sw.) Ignatov & Ignatova

Not reported for Wyoming by FNA (FNA Vol. 28, 2014). Centennial, Albany County (Nelson 2704). "This was published as *Hypnum arcticum* in the report by Dr. Nelson (1900)," Porter (1935). Albany Co., Porter (1937). I have redetermined that specimen as *H. luridum*.

Sublette Co.: Bridger Wilderness, Wind River Range, South Fork Baldy Creek headwaters, 42°59'N, 109°34'W, on rocks along stream, 10,240 ft, 16 May 1989, *Andrus 7843* (BING).



Courtesy FNA Association, FNA 28, 2014

Hygrohypnum styriacum (Limpr.) Broth. in H.G.A. Engler and K. Prantl, Nat. Pflanzenfam. 231(I,3): 1039. 1908.

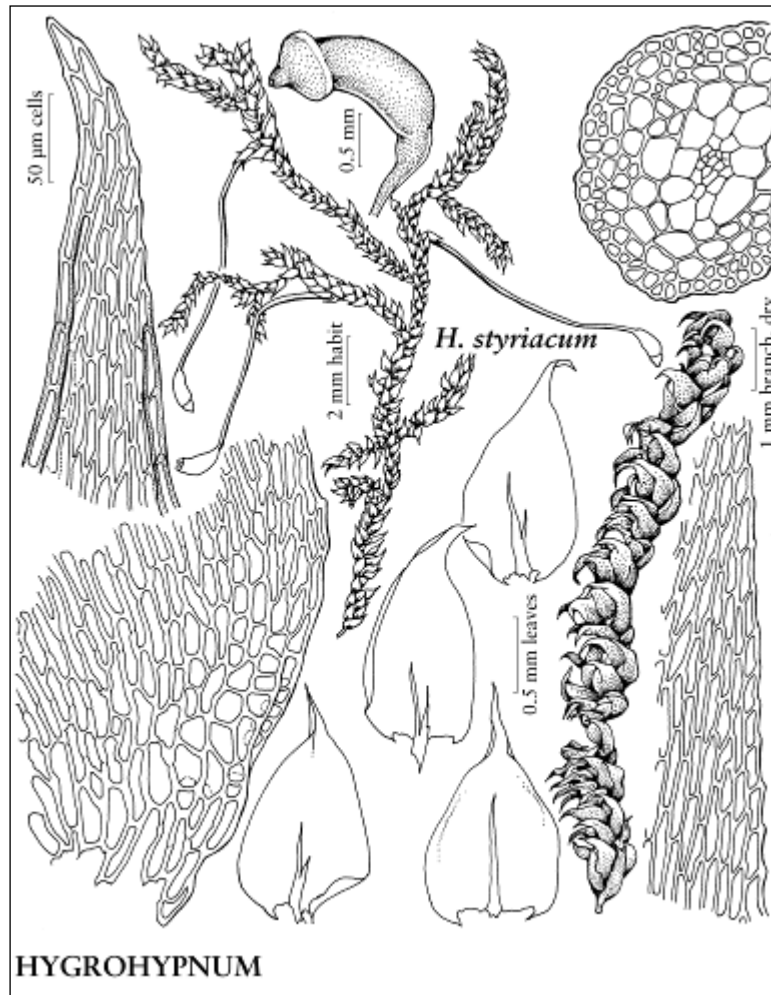
Hypnum styriacum Limpr., Flora 65: 201. 1882.

Eurhynchium styriacum (Limpr.) Kindb.

Wyoming (FNA Vol. 28, 2014).

Park Co.: SNF, Beartooth Plateau: Beartooth Creek, granite debris along the creek, attached to boulders periodically wet by spray and seasonally covered with fast flowing water, associated with *Scouleria aquatica*, T57N R105W S7, 44°36.270–280'N, 109° 36.010–020'W, ca. 8900 ft (2700 m), 23 Aug 2009, *Kosovich-Anderson 5431* (COLO); also Beartooth Lake, W and SW shore, *Picea engelmannii* forest along the shore, on wet clay, associated with *Sanionia uncinata*, *Calliergonella cuspidata*, T57N R105W S6&7, 44°56.500–520'N, 109°35.980–990'W, 2700 m, 24 Jul 2010 *Kosovich-Anderson 6652* (no herb. cited) (also cited by Kosoviich-Anderson & Weber 2011).

Hygrohypnum smithii var. *goulardii* (Schimp.) Wijk & Marg. = *Hygrohypnum molle* (Hedw.) Loeske



Courtesy FNA Association, FNA 28, 2014

HYLOCOMIUM Schimp. in P. Bruch and W.P. Schimper, *Bryol. Europ.* 5: 169, plates 487–493. 1852. (Hylocomiaceae)

Hylocomium splendens (Hedw.) Schimp. in P. Bruch and W.P. Schimper, *Bryol. Europ.* 5: 173. 1852.

Hypnum splendens Hedw., *Sp. Musc. Frond.*, 262, plate 67, figs. 6–9. 1801.

Hylocomium alaskanum (Lesq. & James) Aust.

Hylocomium proliferum (Brid.) Lindb.

Hylocomium splendens var. *alaskanum* (Lesq. & James) Limpr.

Hylocomium splendens var. *compactum* (Lesq. & James) Macoun & Kindb.

Hylocomium splendens subsp. *giganteum* Vitt

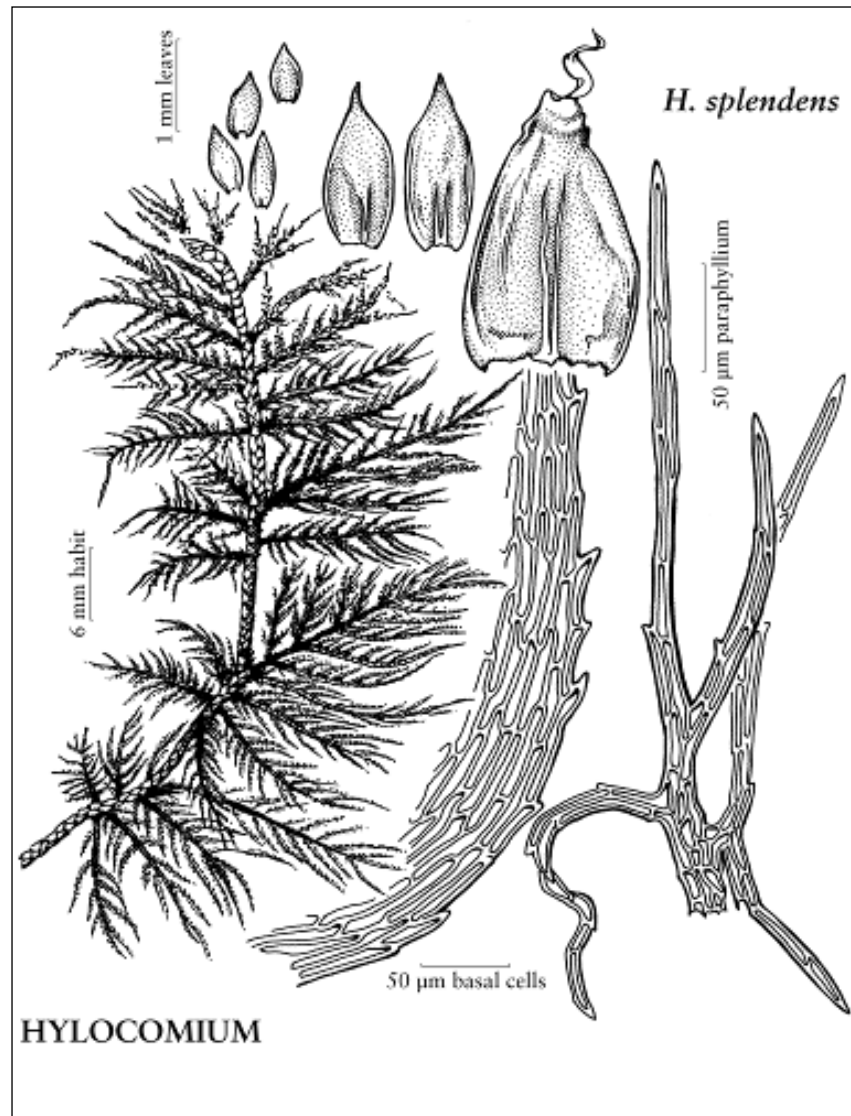
Hylocomium splendens var. *obtusifolium* (Geheeb) Paris

Hypnum proliferum Brid.

Wyoming (FNA Vol. 28, 2014). In Park Co. *Hylocomium splendens* forms a rich bryophyte community combined with *Aulacomnium palustre*, *Climacium dendroides*, *Helodium blandowii*, *Rhizomnium* spp., *Thuidium recognitum*, *Marchantia alpestris*, (*Thuidium recognitum*, q.v.) and others“ (Kosovich-Anderson & Weber 2011). (As *Hylocomium proliferum* (Brid.) Lindb.) Sheridan

County and Yellowstone Natl Park, Porter (1935). Johnson, Sheridan cos., Yellowstone Natl Park, Porter (1937). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Sheridan Co.: Wolf Creek Canyon, *Nelson 2306* (RM).



Courtesy FNA Association, FNA 28, 2014

HYMENOSTYLIUM Brid., *Bryol. Univ.* 2: 81. 1827. (Pottiaceae)

Hymenostylium recurvirostrum (Hedw.) Dixon, *Rev. Bryol. Lichénol.*, n. s. 6: 96. 1934.

Gymnostomum recurvirostrum Hedw., *Sp. Musc. Frond.*, 33. 1801.

Barbula curvirostris fo. *scabra* Lindb.

Gymnostomum recurvirostre var. *scabrum* (Lindb.) Grout

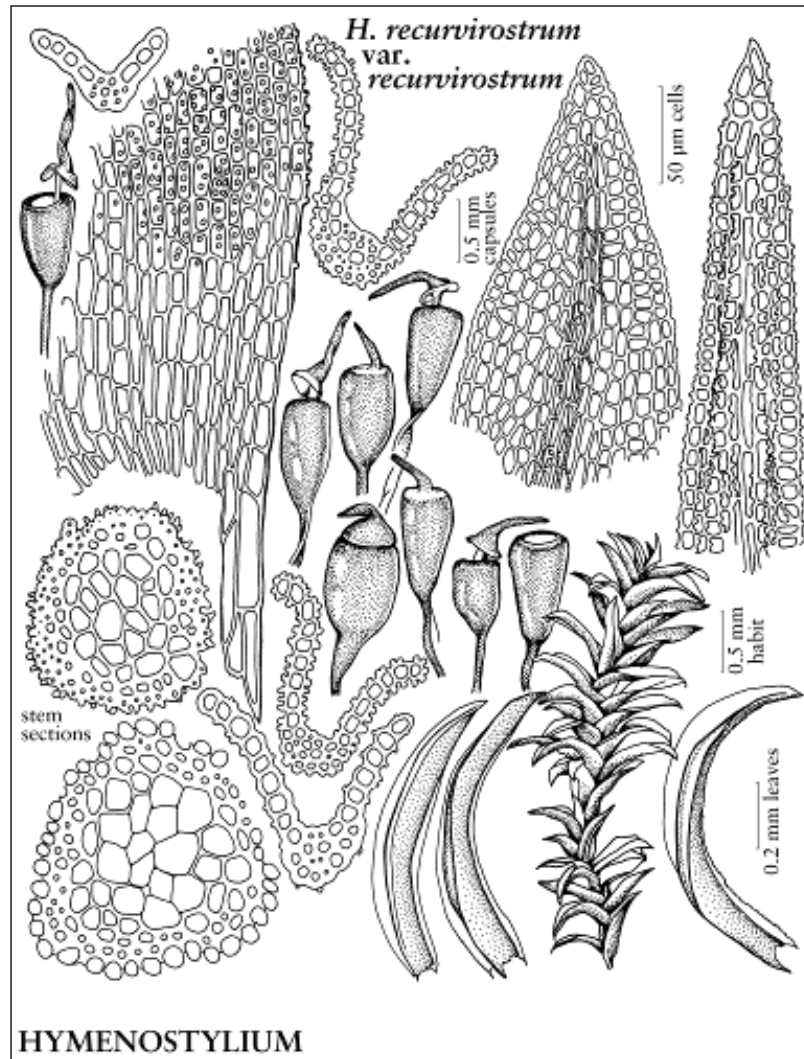
Hymenostylium recurvirostre (Hedw.) Dix.

Weisia curvirostris (Hedw.) Müll. Hal.

Var. **recurvirostrum** (Pottiaceae)

Wyoming (FNA Vol. 27, 2007). British Columbia, Washington, Alberta, Idaho, Montana, Wyoming; Alaska, Nevada, Utah; South Dakota, Iowa, Missouri, Minnesota, Wisconsin, Ontario; New England, New York, Virginia, North Carolina. (As *G. curvirostra* (Ehrh.) Hedw.) Point of Rocks, Sweetwater Co. (*Nelson 8144*); South Butte, Sweetwater Co. (*Nelson 3549*), Porter (1935).

Albany Co.: Medicine Bow Mts., E of Snowy Range Pass, 10 Aug 1953, *Lawton 1663* (WTU). Johnson Co.: 6600 ft, *Nelson 6836a* (RM). Natrona Co.: Hat Six Falls, SE of Casper, 7 Aug 1897, *Nelson 5036* (RM), with *Pseudoleskeella tectorum*. Park Co.: 8600–9000 feet, *Hartman 13131* (RM, BUF). Sweetwater Co.: *Nelson 3549* (RM); on the abrupt face of cliff wet with sulphur water, Point of Rocks, *Nelson 8144* (COLO, WTU).



Courtesy FNA Association, FNA 27, 2007

HYPNUM Hedw., Sp. Musc. Frond., 236, plate 59, figs. 8, 9; plates 60–77. 1801, name conserved (Hypnaceae)
Stereodon (Brid.) Mitt.

If you have what seems apparently a *Hypnum* that has erect capsules, erect or straight leaves and is otherwise *Hypnum*-like, even to the little quadrate cells in the leaf angles, you have probably got *Pylaisiella*, probably *P. polyantha*. *Pylaisiella* species are, additionally, autoicous.

[*Hypnum callichroum* Funck. ex Brid. Evanston, Uinta County (Nelson 4128, in part (see *H. Lindb.ii*). “The identity of this plant is doubtful,” Porter (1935). Uinta Co., Porter (1937), excluded.]

Hypnum cupressiforme Hedw., Sp. Musc. Frond., 291. 1801.
Stereodon cupressiformis (Hedw.) Mitt.

Not reported for Wyoming according to FNA (FNA Vol. 28, 2014), as neither the var. *cupressiforme* nor its other varieties. Albany County (Porter 668 & 1279), Porter (1935). (As *Hypnum vaucheri* Lesq.) Lawton. Albany Co., Porter (1937). “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).

Albany Co.: limestone rock, deep crack, 19 Mar 1988, *Vukelich s.n.* (BUF); Laramie Mtns., Roger Canyon, ca. 8 air mi NE of Laramie, Co. Rd. 17, limestone outcrops with *Cercocarpus montanus*, *Buck 23164*, this may be *H. vaucheri*, see Reese specimen below (NY). Sheridan Co.: limestone boulder in spruce-fir forest, Big Horn Natl Forest, T57N, R89W, Sect. 34, with *Dicranoweisia crispula*, *Tortella tortuosa*, *Tortula norvegica*, 19 Jun 1992, *McKee 92-F4*, c.fr. (RM).

There are vars. *filiforme* Brid., var. *julaceum* Brid., var. *lacunosum* Brid., var. *resupinatum* (Tayl.) Schimp. in Spruce and var. *subjulaceum* Mol. in the Anderson et al. (1990) checklist.

(As var. *resupinatum* a variety not mentioned by Schofield in FNA Vol. 28, 2014): Hawk's Ranch, Colorado-Wyoming State line, Albany County (*Williams 98*), Porter (1935). Albany Co., Porter (1937).

Hypnum lindbergii Mitt., J. Bot. 2: 123. 1864.

Hypnum arcuatum Lindb., Öfvers. Kongl. Vetensk.-Akad. Förh. 18: 371. 1862, not Hedw. 1801.

Calliergonella lindbergii (Mitt.) Hedenäs

Hypnum arcuatum var. *americanum* Ren. & Card.

Hypnum arcuatiforme Kindb.

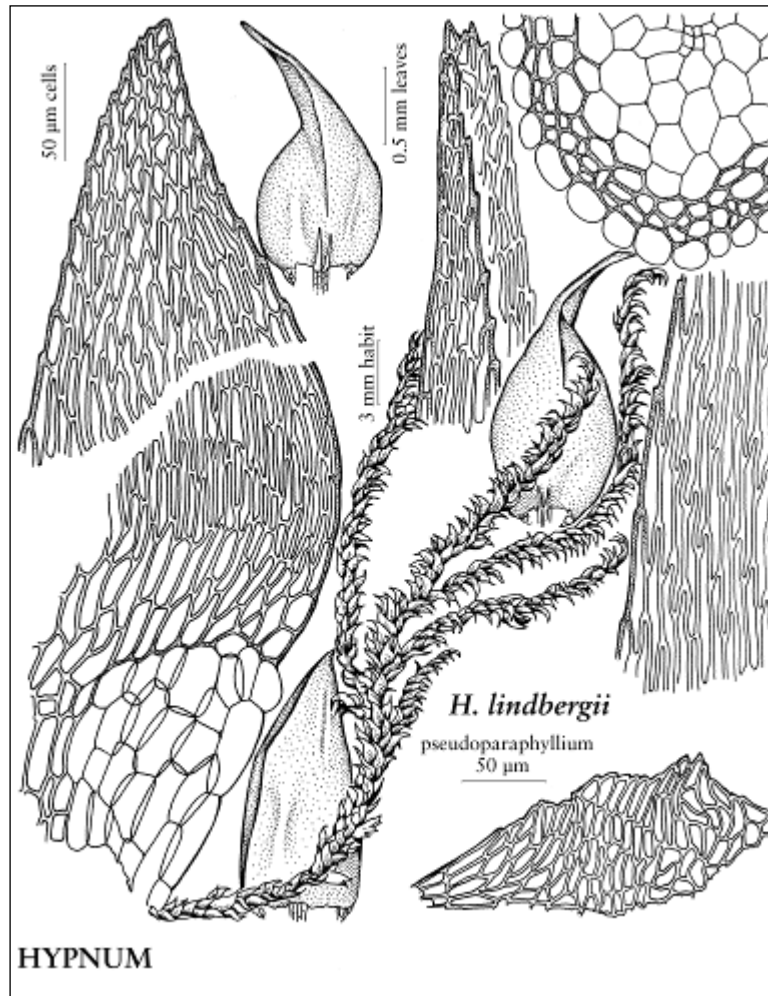
Hypnum Renaulii Kindb.

Stereodon patientiae Lindb.

Wyoming (FNA Vol. 28, 2014). (As *Hypnum arcuatum* Lindb.) Albany County (Porter 770, 780, 1443; and Nelson 8813), Porter (1935). (As *Hypnum arcuatum* Lindb.) Albany Co., Porter (1937). Teton Co., Spence (1985). Johnson Co., in association with *Warnstorfia tundrae* (Lenz 2006). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: 11,000 ft, *Hermann 23430* (RM). Sublette Co.: Bridger Wilderness, Wind River Range 2, 14 May 1989 Barnes Lake, 9747 ft, 42°57'30"N, 109°36'W, mineralized seeps at S end of lake with *Campyllum stellatum*, *Andrus 7801b* (BING). Uinta Co.: Evanston, 27 Jul 1897, *Nelson 4128*, cortical cells inflated, apex of leaves only acuminate, not filiform, falcate not circinate, inflated alar cells not rounded to insertion (RM)

May be confused with *Hygrohypnum ochraceum*, which has “less crowded leaves with acumina twisted and flexuose and much stronger costa” (Crum & Anderson 1981: 1173 (see discussion at *Drepanocladus*). For *H. lindbergii* cells across the insertion may be a nice orange color that may also affect the alar cells (which may appear thickened), which are usually hyaline, inflated. In Colorado (as *Calliergonella lindbergii*), the species is described as common “in willow carrs and along snow-melt streamlets in the subalpine” (Webber & Wittmann 2007). The leaves are strongly falcate, not complanate and the alar cells are in a clearly inflated group.



Courtesy FNA Association, FNA 28, 2014

Hypnum pallescens (Hedw.) P.-Beauvois, Prodr. Aethéogam., 67. 1805.

Leskea pallescens Hedw., Sp. Musc. Frond., 219, plate 55, figs. 1–6. 1801.

Hypnum depressulum Müll. Hal.

Hypnum pallescens var. *protuberans* (Brid.) Lesq. & James

Hypnum reptile Michx.

Stereodon pallescens (Hedw.) Mitt.

Wyoming (FNA Vol. 28, 2014). (As *Hypnum depressulum*) Albany County (*Nelson 5172*, 1924), Porter (1935). Albany Co., Porter (1935). (As *H. reptile* Michx.) Weston Co., Wynne (1943).

Albany Co.: (As *Hypnum pallescens* (Hedw.) P.-Beauv.) La Plata Mines, 25 Aug 1898, *Nelson 5172* (RM); Laramie Hills, 13 Jun 1896, *Nelson 1924* (RM) .

Hypnum pratense Koch ex Spruce, London J. Bot. 4: 177. 1845.

Breidleria pratensis (Koch ex Spruce) Loeske

Hypnum pseudopratense Kindb.

Stereodon pratensis (Koch ex Spruce) Warnst.

Not yet reported for Wyoming according to FNA (FNA Vol. 28, 2014); the genus *Breidleria*, recognized by Weber and Wittmann (2007) in the Colorado flora, has been treated as *Hypnum* (FNA 28, 2014). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Sheridan Co.: moist limestone, Big Horn Natl Forest, T57N, R89W, Sect. 34, with *Homalothecium pinnatifidum*, *Ditrichum capillaceum*, *McKee 92-001* (BUF, RM).

Easily confused with *Hypnum lindbergii* with which it shares many characteristics, such as the hyalodermis of inflated cells around the periphery of the stem cross Sect. (note stem central strand present in both species). *Hypnum lindbergii* has a significant area of inflated, lax, hyaline cells in the alar region of the leaf in distinctive decurrencies. That is not to say *Hypnum pratense* does not also have such inflated, lax and hyaline cells there, but they are less to insignificant or ambiguous, and usually mixed with the flaccid cells of the hyalodermis when stripped from the stem. The inflated cells may occur in only one or two to three rows. The leaves of *H. pratense* are not decurrent; the leaves are weakly falcate, whereas in *H. lindbergii* they are strongly so. In Colorado, the species (as *Breidleria pratensis*) is described as having stems “dorsiventrally compressed, the leaves complanate, in one plane and closely overlapping, not strongly falcate, slightly denticulate apically, the margins plane, alar cells not sharply delimited. It is inconspicuous and rarely collected, but expected to be frequent in willow carrs and wet tundra” (Weber & Wittmann 2007).

Hypnum revolutum (Mitt.) Lindb., Öfvers. Kongl. Vetensk.-Akad. Förh. 23: 542. 1867.

Stereodon revolutus Mitt., J. Proc. Linn. Soc., Bot., suppl.: 97. 1859.

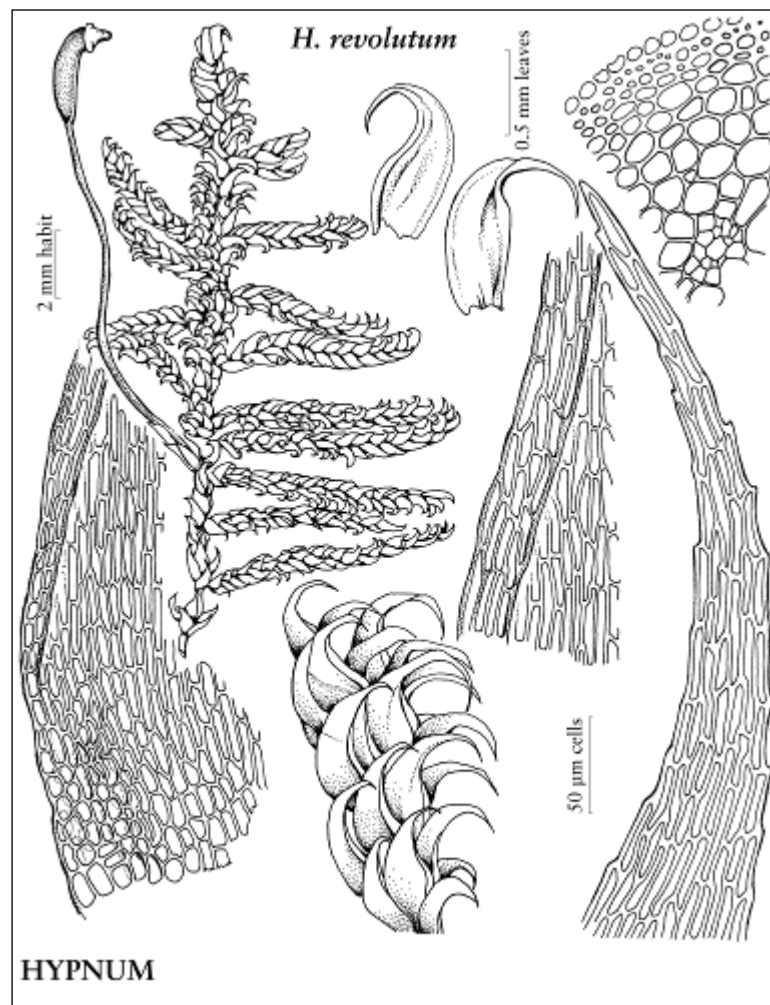
Var. **revolutum**

Wyoming (FNA Vol. 28, 2014). (As *Hypnum heufleri* Jur.) Wyoming: Yellowstone Natl Park (1537-38, 1541, 1555) (Roell 1893). “Very common.” Albany County, Carbon County, Sublette County, Teton County, and Yellowstone Natl Park, Porter (1935). Albany, Carbon, Sublette, 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).

Albany Co.: 9800 ft, *Hermann 23427* (RM); *Hermann 17752* (RM); Medicine Bow Mtns., Barber Lake picnic area, 2.5 mi due NW of Centennial, 8700 ft, *Pinus contorta* forest along Libby Creek, on boulder, 7 Jun 1993, *Reese 18168* (LAF). Big Horn Co.: just off US 16 between TenSleep & Buffalo (near Sitting Bull Campsite), *Pinus contorta* var. *latifolia* being lumbered, just N of Washakie Co. border, ca. 5000 ft, disturbed soil with *Bryum lisae* var. *cuspidatum*, *Ceratodon purpureus*, 6 Jul 1985 *Eckel 94092203* (BUF). Fremont Co.: 7800 ft, *Hermann 25535* (RM); soil on rock, Douglas fir slope 1/2 mi E of Horse Creek Campground, 7800 ft, Absaroka Range, 11 mi N of Dubois, 28 Aug 1973, *Hermann 25536* (RM). Park Co.: 6500 ft, *Hermann 20040* (RM); 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 1792* (BUF). Sheridan Co.: limestone boulder in spruce-fir forest, Big Horn Natl Forest, T57N, R89W, Sect. 34, *McKee 92-F1* (BUF, RM).

Sublette Co.: 7850 ft, *Hermann 25318* (RM); Bridger Wilderness, Wind River Range, Barnes Lake, 9747 ft, 42°57'30"N, 109°36'W, at base of trees by lake, 14 May 1989, *Andrus 7804* (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, 5 Jul 1985, *Eckel 961259* (BUF, RM). Teton Co.: 7000 ft, *Hermann 25557* (RM). Yellowstone Natl Park: Bartley, *Pontious 7* (RM).

“Since the leaves tend to be strongly channeled, it is often difficult to observe whether the margin is actually revolute. I have often had to prove the point with cross Sect.s of the leaves” Flowers (1973: 513). The Big Horn Co. specimen (*Eckel 94092203*) is golden-green to brown as the descriptions indicate, rather than all green, as *H. pallescens* is said to be. The distribution of *Hypnum revolutum* var. *ravaudii* (Boulay) Ando is problematic as “The variety is troublesome to determine because of its lack of the characteristic revolute margins (except sometimes near the base), and the costa is difficult to discern” (Schofield in FNA Vol. 28, 2014).



Courtesy FNA Association, FNA 28, 2014

Hypnum vaucheri Lesq., Mém. Soc. Sci. Nat. Neuchâtel 3(3): 48. 1846.

Hypnum complexum (Mitt.) A. Jaeger & Sauerb.

Hypnum subcomplexum Kindb.

Stereodon vaucheri (Lesq.) Broth.

Wyoming (FNA Vol. 28, 2014). Campbell Co., Medina (1994). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: Medicine Bow Mtns., Barber Lake picnic area, ca. 2.5 mi due NW of Centennial ca. 8700 ft, *Pinus contorta* forest along Libby Creek, on duff, Reese 18169 (LAF); Laramie Mtns, Roger Canyon, 8 air mi NE of Laramie City center, 7850–8000 ft on soil, associated with limestone outcrop, 7 Jun 1993, Miller 10,239 (NYS).

Hypnum vaucheri is a tiny plant, irregularly branched, subjulaceous, especially when wetted. One thinks of *H. revolutum*, but the margins are not recurved except a little at the base—they are erect on a concave leaf to inward, making the leaf tubulose to a channeled apex. Flowers (1973) gives a strikingly good description of the Reese specimen. He says *H. vaucheri* “is one of the dominant mosses in localized parts of the Colorado-Green River Basin, where it grows on dry rocks and ledges, often on sandy soil sheltered by overhanging rocks, bases of trees, shrubs and bunchgrasses. Elsewhere in the state it is less frequent.” It is indeed, as he says, “brownish green and somewhat glossy when dry.” It is also notable for its large area of quadrate cells, in well defined groups about twice as long as wide, to 15 cells up the leaf margin. Although the Reese specimen shows mostly secund-falcate leaves, these are variable to straight. This variability is distinctive. Paraphyllia are foliose!

IMBRIBRYUM N. Pedersen, Bryologist 108: 449. 2005. (Bryaceae)

[*Imbribryum alpinum* (Hudson ex Withering) N. Pedersen, Bryologist 108: 449. 2005 1801, excluded.]

Bryum alpinum Hudson ex Withering, Syst. Arr. Brit. Pl. ed. 4, 3: 824. 1801.

Not reported for Wyoming in FNA; its western distribution is Alaska, California, and Colorado; the species requires taxonomic revision (Spence, FNA Vol. 28, 2014). (As ?*Bryum alpinum* Huds. ex With.): Sheep Mountain, Albany Co. (*Goodding 2098*), Porter (1935).

(As *Bryum alpinum* Huds. ex With.): In one specimen from Europe, the red-orange and green color is evident, like the pink-green of *B. weigeli*, it is not of the ruby red variety: resembles a *Pohlia*. Basal cells seem thinner walled, more hyaline and in old or young leaves sort of auriculate. The leaf is bellied, concave, the margins broadly reflexed, and then tightly revolute on the extreme margins to below the apex. The costa is not or shortly percurrent and the apex broadly acute. Leaf cells are rectangular and broad. The lower stems are not covered with rhizoids such that they appear outside the leaves, so not “matted” but rather “clean-shaven”, actually, and long and fine. The stem from Colorado showed a clear “year” difference, or at least two distinct growing periods with two different sets of leaves, the first period the leaves are brick red like the stem and more lanceolate and narrowly acute with percurrent costae. The second growth is fair green, more ovate (broadest across the middle), more broadly acute and the costae subpercurrent. The leaf cells more linear-rhomboidal and the walls robust to thick, the cells at the base becoming “bubbly,” turgid and hyaline and thinner walled, quadrate, the central basal cells differentiated almost, conspicuously bigger below the belly of the leaf, rectangular than the upper median laminal cells (seen in older leaves). The belly of the leaf ends several cells below the apex of the leaf, leaving the apex flat. *Bryum alpinum* has entire leaves or minutely denticulate in apex; margins recurved nearly to the apex: more often acute, occasionally only, obtuse, costa of some leaves shortly *excurrent*. *Ptychostomum cyclophyllum*, a reddish moss with small, obtuse leaves is distinctive by its contorted leaves when dry; *B. gemmiparum*, which is also scarcely contorted, but it is said to not have reddish color except when old.

Imbribryum gemmiparum (De Not.) J.R. Spence, *Phytologia* 89: 112. 2007.

Bryum gemmiparum De Not., *Comment. Soc. Crittog. Ital.* 2: 211. 1865.

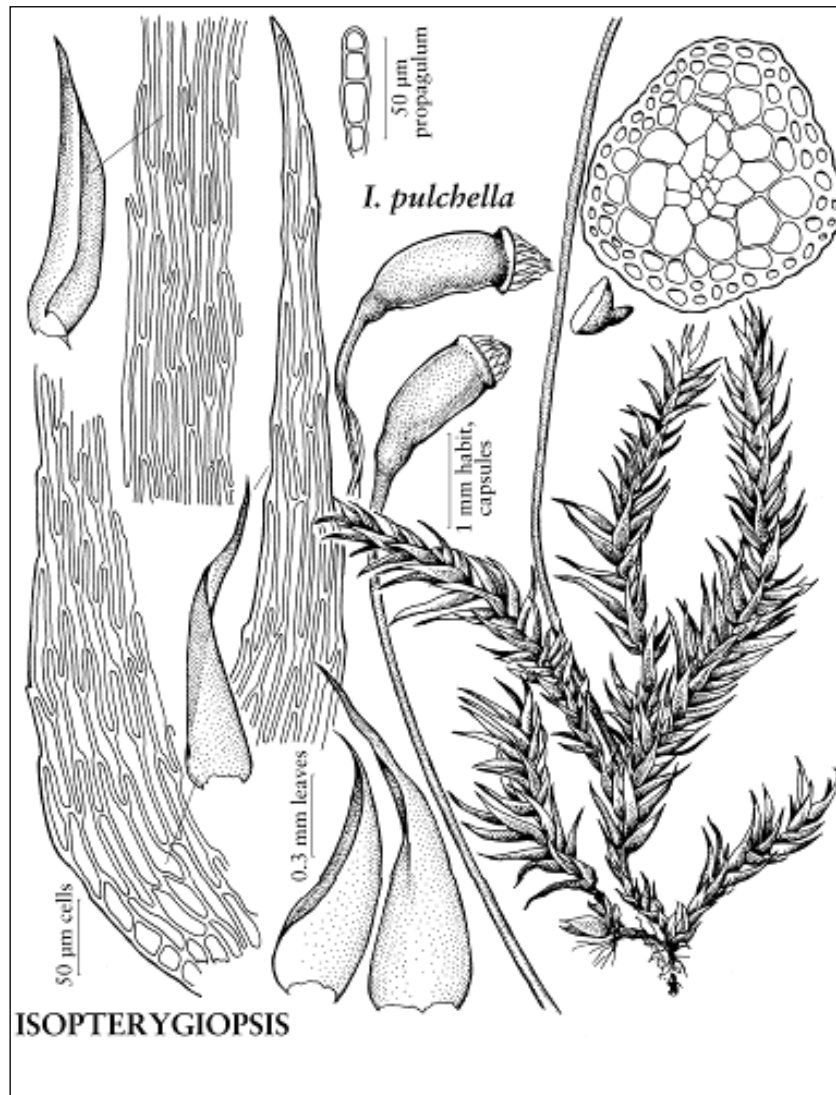
Wyoming (FNA 28, 2014).

Imbribryum muehlenbeckii (P. Bruch & Schimp.) N. Pedersen, *Bryologist* 108: 449. 2005.

Bryum muehlenbeckii P. Bruch & Schimp., *Bryol. Europ.* 4: 163, plate 381. 1846.

Not reported for Wyoming by FNA (FNA Vol. 28, 2014). (As *Bryum muehlenbeckii*)
Wyoming: Yellowstone Natl Park, sterile (1513) (Roell 1893).

Park Co.: SNF, Beartooth Plateau, SE shore of Island Lake, ecotone zone between willow wetlands and subalpine *Picea engelmannii* forest, on wet loamy soil, in shade, T57N R105W S3, 44°56.690–700' N, 109°32.230–240'W, 2900 m, 12 Aug 2008, *Kosovich-Anderson 2371* (ASC, COLO, DUKE) “det. by J. Spence” (see also Kosovich-Anderson & Weber 2011).



Courtesy FNA Association, FNA 28, 2014

ISOPTERYGIOPSIS Z. Iwatsuki, J. Hattori Bot. Lab. 33: 379, fig. 21. 1970. (Hypnaceae)

Isopterygiopsis pulchella (Hedw.) Z. Iwatsuki, J. Hattori Bot. Lab. 63: 450. 1987.

Leskea pulchella Hedw., Sp. Musc. Frond., 220, plate 55, figs. 7–12. 1801.

Holmgrenia diminutiva Grout

Hypnum nitidulum Wahlenberg

Isopterygium nitidulum (Wahlenb.) Kindb.

Isopterygium pulchellum (Hedw.) A. Jaeger

Isopterygium pulchellum var. *nitidulum* (Wahlenberg) Roth

Orthothecium diminutivum (Grout) H.A. Crum, Steere, & L.E. Anderson

Plagiothecium passaicense Aust.

Plagiothecium pseudolatebricolum Kindb.

Plagiothecium pulchellum (Hedw.) Schimp.

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

Albany Co.: La Plata Mines, c.fr., 29 Aug 1898, *E. Nelson 5242* (RM), (orig. det. as *Plagiothecium Sullivantiae* Sch.—specimen autoicous, stem cortical cells thick walled).

“Brooklyn Lake, Albany County (*Elias Nelson 5242*)” Porter (1935)—note that the label cited by Porter here does not bear the same data for Nelson 5242 as the specimen at RM. *Plagiothecium roseanum*, or *P. cavifolium* (Brid.) Iwats. is here excluded from Wyoming.

JAFFUELIQBRYUM Thériot, Rev. Bryol., n. s. 1: 192, plate 8, figs. 1–5. 1928. (Grimmiaceae)

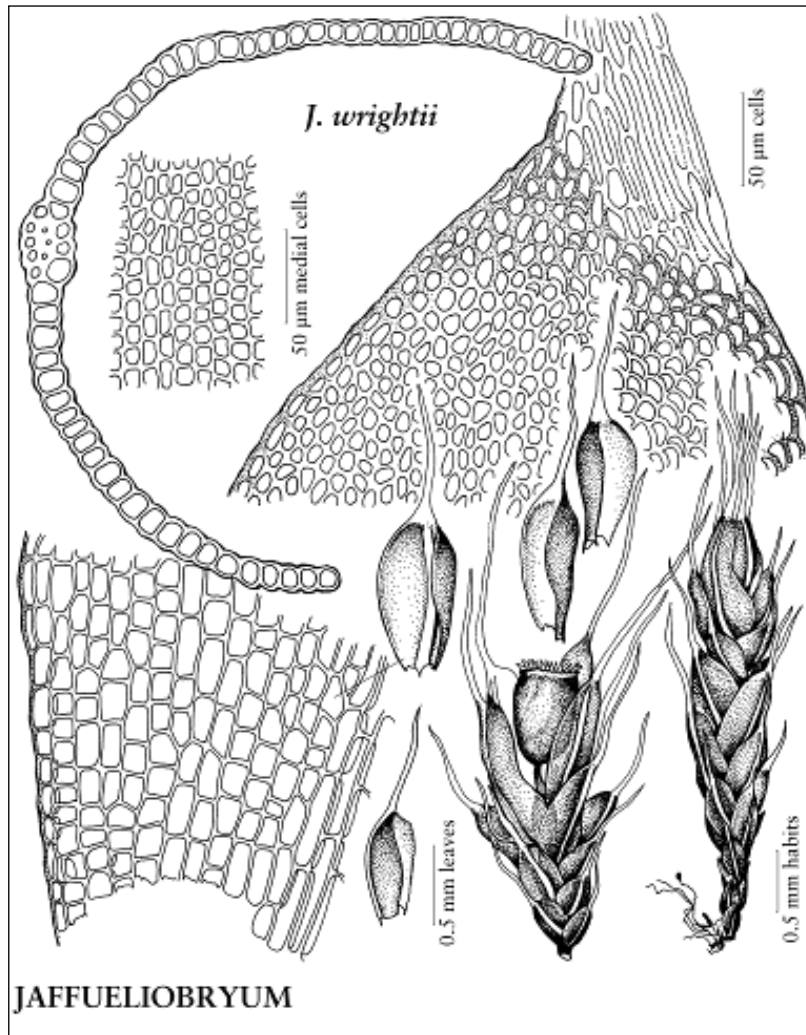
Jaffueliobryum wrightii (Sull.) Thériot, Rev. Bryol., n. s. 1: 193. 1928.

Coscinodon wrightii Sull., Musc. Hepat. U.S., 132. 1856.

Grimmia wrightii (Sull.) Aust.

Laramie Co.: Pine Bluffs Rest Area on the I–80, Pine Bluffs, from holes in boulders sitting on rest area lawn, had been relocated from bluff, assoc. *Bouteloua gracilis* and other prairie ssp. (lawn grass), 22 Mar 1996, *Hoy 314*, young, calyptrate fruit, (BUF).

Lawton suggested that *Grimmia raii* Aust. (Bull. Torrey Club 6: 46. 1875) “is described as having the leaves entire, but specimens determined as *G. raii* commonly have some of the upper leaves minutely denticulate at the apex. it is questionable whether *G. raii* should be maintained as a distinct species” (Lawton 1971: 123). (As *G. raii* Aust) Carbon Co. “Rawlins, Jul 13, 1942, Degener & Peiler 16968” Wynne (1943). “Rare in the Pacific Northwest” Lawton.



Courtesy FNA Association, FNA 27, 2007

KINDBERGIA Ochyra, Lindb.ia 8: 53. 1982. (Brachytheciaceae)

Eurhynchium subg. *Stokesiella* Kindb., Eur. N. Amer. Bryin. 1: 93. 1897, not *Stokesiella* Lemmermann 1908 (Chrysophyta).

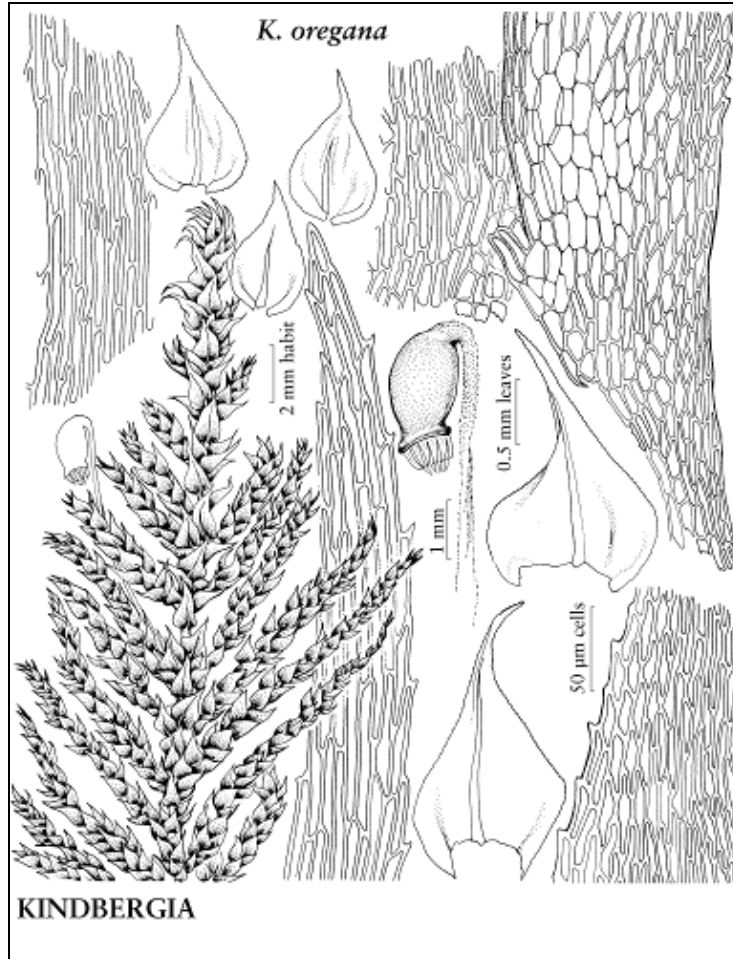
Kindbergia oregana (Sull.) Ochyra, Lindb.ia 8: 54. 1982.

Hypnum oreganum Sull., Mem. Amer. Acad. Arts, n. s. 4: 172. 1849.

Eurhynchium oreganum (Sull.) A. Jaeg.

Stokesiella oregana (Sull.) Robins.

Not reported for Wyoming in FNA (FNA Vol. 28, 2014). (As *Eurhynchium oreganum*) Teton Co., Spence (1985).



Courtesy FNA Association, FNA 28, 2014

LEPTOBRYUM (Schimp.) Wilson, Bryol. Brit., 219. 1855. (Meesiaceae)

Bryum subg. *Leptobryum* Schimp. in P. Bruch and W.P. Schimper, Bryol. Europ. 4: 1. 1851.

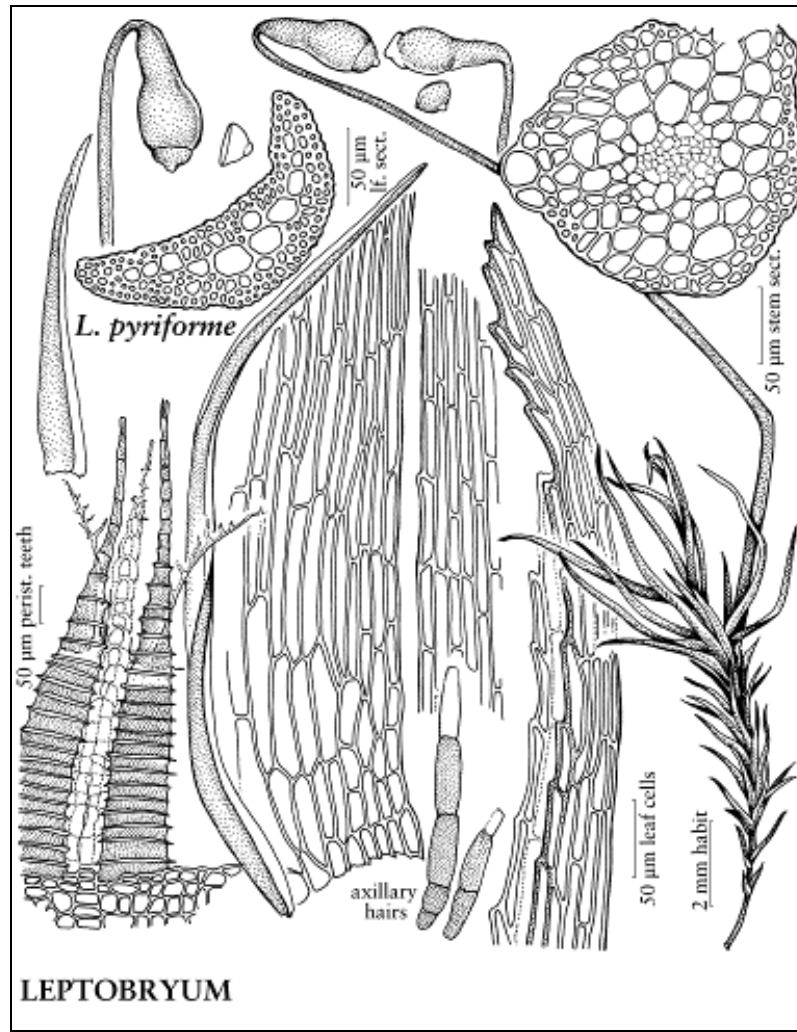
Leptobryum pyriforme (Hedw.) Wilson, Bryol. Brit., 219. 1855.

Webera pyriformis Hedw., Sp. Musc. Frond., 169. 1801.

Wyoming (FNA Vol. 28, 2014). Wyoming: Yellowstone Natl Park, c. fr., (1520) (Roell 1893). Cosmopolitan and common. "Common throughout most of the the State. Albany, Carbon, Fremont, (Sheridan), Sublette, Teton cos., Yellowstone Natl Park, Porter (1935). Teton Co., Spence (1985). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: 7800 ft, *Hermann 25930* (RM); NW base of Sheep Mtn., seep area (calcareous fen) with *Populus*, *Betula*, and *Salix* dominant, 7 Jun 1993, *Buck 23223*, c. fr., young, some undeveloped (NY); La Plata Mines, 25 Aug 1898, *E. Nelson 5176*, in *Mnium marginatum* (packet), with *Bryum turbinatum* (RM). Bighorn Co.: Big Horn Mtns., on rotten logs, 8300 ft, 13 Jul 1979, *Nelson 3658* (RM). Carbon Co.: Haggarty Creek, Sierra Madre Mtns., 8440 ft, moist soil by creek, *Kastning-Culp 3032*, c.fr. (BUF). Fremont Co.: 8400 ft, *Hermann 25516* (RM). Johnson Co.: 6600 ft, *Nelson 6836b* (RM). Park Co.: 9500 ft, *Hermann 20069* (RM). Sweetwater Co.: ca. 6400 ft, on US (187)191, at 14-Mile Reservoir picnic area, moist soils in shade above brooklet, with *Hennediella*

heimii, *Campylium chrysophyllum*, 5 Jul 1985, Eckel 120186 (BUF, RH). Teton Co.: 7000 ft, Hermann 25567 (RM). Yellowstone Natl Park, 8000 ft, Hermann 20024 (RM); Nelson 7804 (RM).



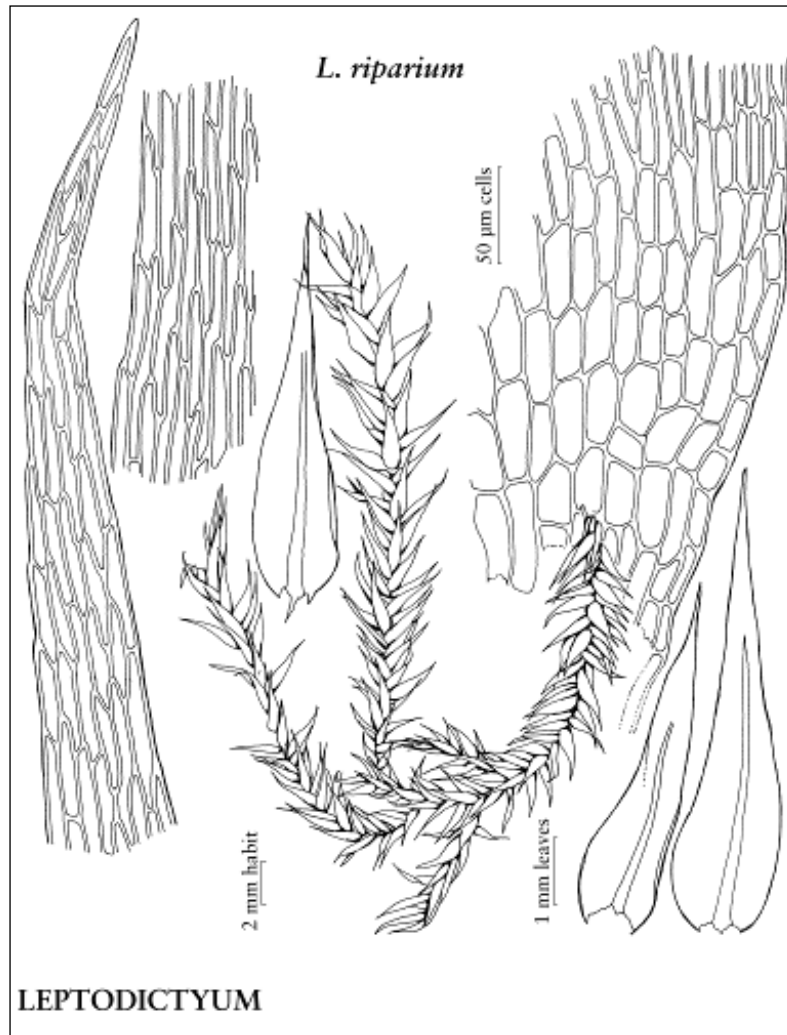
Courtesy FNA Association, FNA 28, 2014

Leptobryum pyriforme may be confused with another genus with long, setaceous leaves: *Distichium*, which has leaves coming off the stem alternately left and right, presenting a flattened face on the stem, whereas *Leptobryum* is whorled and the stem and leaves together are cylindrical overall. The capsules of *Distichium* are cylindric and erect to slightly inclined from the vertical, whereas *Leptobryum* has its distinct obpyriform (upside-down pear-shaped), highly glossy capsules.

LEPTODICTYUM (Schimp.) Warnst., Krypt.-Fl. Brandenburg 2: 867. 1906. (Amblystegiaceae)

Amblystegium subg. *Leptodictyum* Schimp., Syn. Musc. Eur., 595. 1860.

Leptodictyum humile (P.-Beauv.) Ochyra = *Hygroamblystegium varium* var. *humile* (P.-Beauv.) Vanderpoorten & Hedenäs



Courtesy FNA Association, FNA 28, 2014

Leptodictyum riparium (Hedw.) Warnst., Krypt.-Fl. Brandenburg, Laubm. 2(5): 878. 1906.

Hypnum riparium Hedw., Sp. Musc. Frond., 241. 1801.

Amblystegium brevipes Card. & Thériot

Amblystegium riparium fo. *fluitans* (Lesq. & James) Flow.

Amblystegium riparium var. *abbreviatum* Schimp. in B.S.G.

Amblystegium riparium var. *flaccidum* (Lesq. & James) Ren. & Card.

Amblystegium riparium var. *fluitans* (Lesq. & James) Ren. & Card.

Amblystegium riparium var. *longifolium* (Schultz) Schimp.

Brachythecium pennellii E.B. Bartram

Campylium polygamum var. *longinerve* (Ren. & Card.) Grout

Leptodictyum brevipes (Card. & Thériot) Broth.

Leptodictyum laxirete (Card. & Thériot) Broth.

Leptodictyum riparium var. *abbreviatum* (Schimp.) Grout

Leptodictyum riparium var. *brachyphyllum* (Card. & Thér.) Grout

Leptodictyum riparium var. *elongatum* (Schimp. in B.S.G.) Warnst.

Leptodictyum riparium var. *flaccidum* (Lesq. & James) Grout

Leptodictyum riparium var. *longifolium* (Schultz) Warnst.

Leptodictyum riparium var. *nigrescens* Wynne in E. Whiteh.
Leptodictyum riparium var. *obtusum* (Grout) Grout
Leptodictyum siphon (P.-Beauv.) Broth
Leptodictyum vacillans (Sull.) Broth.
Rhynchostegiella georgiana Dixon & Grout

Wyoming (FNA Vol. 28, 2014). (As *Leptodictyum riparium*) Albany Co., Yellowstone Natl Park, Porter (1937).

Albany Co.: NW base of Sheep Mtn. along WY 11, ca. 4 air mi ESE of Centennial, seep area (calcareous fen) with *Populus*, *Betula*, and *Salix*, Buck 23235 (NY). Teton Co.: (var. *longifolium* (Schultz.) Mönk.) boggy area, 6700 ft, Lichvar 704 (RM).

The overall delicacy of this species distinguishes it from species in the similar genus *Amblystegium*. The costa is thinner than the those in *Amblystegium*, except perhaps that of *A. serpens*, but this plant is usually bigger. In the Buck specimen, the plants have similar shape to *A. serpens* but are larger, larger cells, more delicate so more delicate in color (pale green). The apex was acuminate, the leaf broad at the base.

Lescurea radicata (Mitt.) Mönk. = *Pseudoleskea radicata* (Mitt.) Mac. & Kindb.

Limprichtia revolvens (Sw.) Loeske = *Scorpidium revolvens* (Sw.) Rubers