*Phytologia* (November 1991) 71(5):390-413.

# NOTES ON NEW INFRASPECIFIC TAXA AND HYBRIDS IN NORTH AMERICAN *POA* (POACEAE)

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ABSTRACT

Five new infraspecific combinations and three new subspecies are proposed. **Poa abbreviata** subsp. **marshii**, **P. arctica** subsp. **lanata**, **P. cusickii** subsp. **purpurascens**, **P. hartzii** subsp. **alaskana**, **P. hartzii** subsp. **ammophila**, **P. laxa** subsp. **banffiana**, **P. pratensis** [subsp. **alpigena**] var. **colpodea**, and **P. secunda** subsp. **juncifolia**. *Poa evagens* is assigned to *Deschampsia caespitosa* subsp. *brevifolia*, and the putative parentage of *P.* x *fibrata* (*P. pratensis* x *P. secunda* subsp. *juncifolia*) is discussed. Comments on the new taxa, new combinations, relationships of these taxa, additional chromosome counts, and keys are provided.

KEY WORDS: *Poa, Deschampsia*, grasses, Poaceae, taxonomy, apomixis, hybrids, polyploidy, North America, arctic, alpine

1. **Poa abbreviata** R. Br. subsp. **marshii** R.J. Soreng, *subsp. nov.* TYPE: U.S.A. Idaho: Blaine Co., Sawtooth Mts., head of Boulder Creek Canyon, 10,000′, granite talus, 2 Aug 1937, *J.W. Thompson 14083* (HOLOTYPE: US 1649210!; Isotypes: CAS,CU!,F,GH,NY!,RSA!,WTU) (Fig. 1).

A *P. abbreviata* R. Br. subsp. *abbreviata* et subsp. *pattersonii* (Vasey) A. Löve, D. Löve, & Kapoor lemmatibus glabris et callo arachnideo differt.

Perennial. Culms 5-15 cm tall, slender, from small dense tufts with narrow bases, shoots intravaginal. Upper culm leaf sheath margins fused 1/10-1/4 the length; ligules 1-3 mm long, smooth; blades 1.0-1.5 mm wide, folded and inrolled, lacking papillae, abaxially smooth, adaxially scabrous on and between

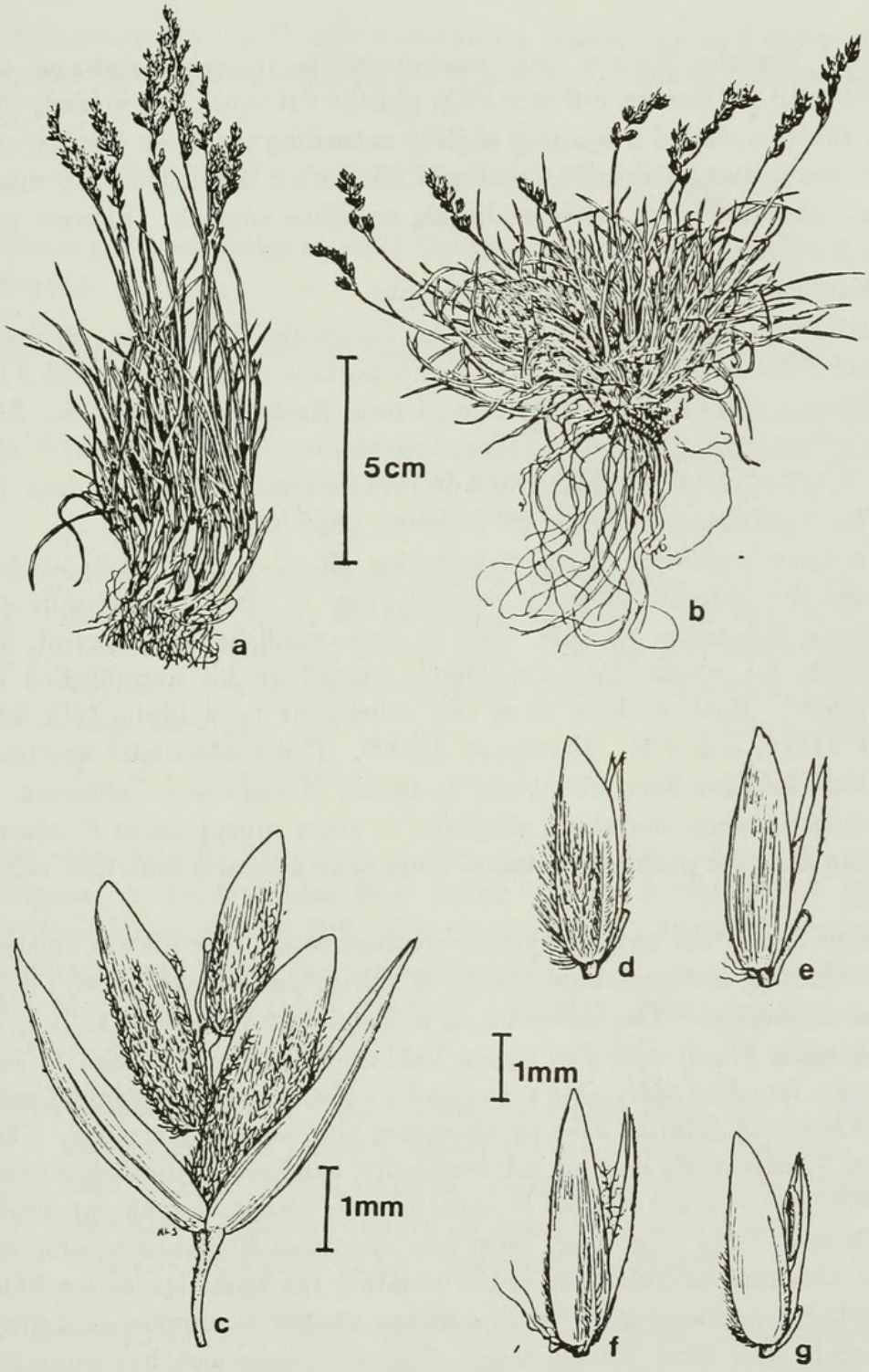


Figure 1. *Poa abbreviata* R. Br. subspp. a. subsp. *marshii* R.J. Soreng, habit (*Thompson 14083*; HOLOTYPE: US 1649210!). b. subsp. *abbreviata*, habit. c. subsp. *abbreviata*, spikelet. d. floret (*Holmen 6626*). e. subsp. *marshii*, floret (*Hitchcock & Muhlick 11146*). f. subsp. *pattersonii*, (Vasey) A. Löve, D. Löve & Kapoor (*jordalii* form), floret (*Cantlon & Gillis 57-797*). g. subsp. *pattersonii*, floret (*Soreng & Spellenberg 1165*).

the veins. Panicles 2-5 cm long, lanceolate, the branches scabrous angled. Spikelets with 2-4 florets, 5-6 mm long; glumes subequal, 1-3 veined, the first slightly shorter, second frequently slightly exceeding the lower lemma; calluses of the lower lemmas webbed (sometimes minutely); lemmas 3.5-4.0 mm long, glabrous, smooth; palea keels scabrous; rachillas smooth. Flowers perfect; anthers 0.6-1 mm long.

Habitat. High alpine slopes rocky slopes.

Distribution and Specimens. U.S.A. California (Mono Co., White Mts., *Morefield & Ross 4695.2* RSA!, with subsp. *pattersonii M. & R. 4695.1* RSA!). Idaho (Blaine Co. [TYPE]; Butte Co., Lemhi Range, Diamond Pk., *Moseley 507* NY!; Custer Co., Lost River Mts., Leatherman Pass, *Hitchcock & Muhlick 11146* CU!,GH,NY!,US,WTU). Nevada (White Pine Co., Shell Creek Range, Shell Pk., *N. Holmgren, Reveal, & Lafrance 2245* NY!).

Subspecies *marshii* is distinguished from all other *Poa abbreviata* only in having entirely smooth, glabrous lemmas (Fig. 1). It was independently described as a subspecies by D.D. Keck in an unpublished manuscript, and by V.L. Marsh, for whom the subspecies is named, in his unpublished dissertation (1950). Both authors cited two collections from Idaho (*Hitchcock & Muhlick 11146*, and *J.W. Thompson 14083*). Three additional specimens of subsp. *marshii* have been discovered in Idaho, Nevada and California. With one exception, subsp. *marshii* is allopatric to other subspecies of *P. abbreviata*, suggesting that the proposed taxon is more than a local population variant or a hybrid.

Recognition of the new subspecies involved restricting the circumscription and reevaluating the geographic range of subsp. *pattersonii* (Vasey) A. Löve, D. Löve, & Kapoor. The latter taxon is frequently confused (as it is in the *Intermountain Flora*) with *Poa glauca* Vahl sensu lato (s. lat.) and *P. secunda* J.S. Presl s. lat. *Poa abbreviata* s. lat. and *P. glauca* can be distinguished from one another with relative ease by observing the base of the plant. The new shoots of *P. abbreviata* develop intravaginally, the bases of both flowering and nonflowering shoots are clothed in sheaths with blades, and the prophylls are generally more than 1 cm long. Most new shoots of *P. glauca* develop extravaginally, breaking laterally out of old sheaths, the basal leaves are bladeless (cataphylls), nonflowering shoots of a season are few in number, and prophylls are generally less than 0.6 cm long. *Poa abbreviata* also has more slender culms and lustrous spikelets. These differences in ramification and aspect are correlated with differences in anther length: 0.2-1.2 mm long in *P. abbreviata*, and 1.2-2.5 mm long in *P. glauca*. The anthers of *P. secunda* are even longer (1.5-3.0 mm), the lemmas are only weakly keeled and never have an isolated single tuft of hair (web) on the dorsal surface of the callus, and the longest panicle branches exceed 1.8 cm in length. (Many specimens previously filed under *P. pattersonii* Vasey have been annotated as other species. Those I have verified as this subspecies are listed below. See also comments under *P. laxa*.)

Under this interpretation *P. abbreviata* subsp. *pattersonii* and subsp. *marshii* are only known to be sympatric in the White Mountains of California.

## KEY TO THE SUBSPECIES OF *POA ABBREVIATA*

1. Lemmas glabrous; callus of basal florets webbed; U.S.A. California, Idaho, Nevada. ..... subsp. *marshii*

1. Lemmas pubescent; callus of basal florets webbed or not. ..... 2

    2. Lemma intervein regions abundantly pubescent, callus glabrous (rarely distinctly webbed); arctic tundras; circumboreal, north of 60° N (rare in western North America and eastern U.S.S.R.) (map p. 147., Hultén, 1974); $2n = 28$, **42**, 70, 76. .....subsp. *abbreviata*

    2. Lemma intervein regions glabrous or sparsely puberulent, callus frequently webbed; alpine to arctic tundras; Far eastern U.S.S.R. CANADA. Alberta, British Columbia, sw Northwest Territories, Yukon. U.S.A. Alaska, California, Colorado, Montana, Utah, Wyoming; $2n = 42$. ..... subsp. *pattersonii*

2. *Poa abbreviata* R. Br. subsp. *pattersonii* (Vasey) A. Löve, D. Löve, & Kapoor, Arctic & Alpine Res. 3:142. 1971. BASIONYM: *Poa pattersonii* Vasey, Contr. U.S. Natl. Herb. 1:275. 1893. TYPE: U.S.A. Colorado: mts. about the head waters of Clear Creek, 11-14,000′, top of Mt. McClellan near Grays Peak, 19 Aug 1885, *Patterson 154* (Isotypes: NY!,US 556757!,US s.n.!).

    *Poa jordalii* A. Pors., Canad. Field-Naturalist 79:82, fig. 1. 1965. *Poa abbreviata* R. Br. subsp. *jordalii* (A. Pors.) Hultén, Bot. Not. 126:468. 1973. TYPE: U.S.A. Alaska: south slope of Brooks Range, Bettle's River, in alpine tundra on limestone, elev. 2000′, *L.H. Jordal 2284* (HOLOTYPE: CAN!; Isotype: US 1980583!).

Chromosome number. $2n = 42$, U.S.A. Montana: Anaconda-Pintlar Wilderness, Mt. Tiny, *Soreng & Spellenberg 1165*; Colorado: Hoosier Ridge, *Soreng et al. 2548*, Mt. Evans, *Soreng et al. 2555.* These three new counts agree with the two previous counts for subsp. *pattersonii* from Colorado (Löve *et al.* 1971), and a report for "subsp. *jordalii*" (A. Pors.) Hultén from the U.S.S.R., as well as the most frequent number reported for subsp. *abbreviata* (Löve & Löve 1975).

Distribution and Verified Specimens. CANADA. Alberta (Waterton Lakes N.P., Avion Ridge, *Breitung 17288* US!). British Columbia (Antimony Mt.,

50° N x 122° W, *Tisdale 1938* UBC!; Summit Pass, 58° N x 124° W, *Raup & Correll 10651* CAN!, *10705* CAN!,UBC!, *10704* CAN!). Northwest Territories: District of Mackenzie (Mackenzie Mts., 63° N x 128° W, *Cody 16690* CAN!; Nahanni N.P., 62° N x 127° W, *Talbot T 6145* CAN!). Yukon (Sheep Mt., 61° N x 139° W, *Krajina & Hoefs 1970* UBC!).

U.S.A. Alaska (Kanayut Lake, 68° N x 151° W, *Spetzman* 1958 *s.n.* US!,US!; Ambresvajun Lake, 68° N x 144° W, *A. & C. Batten 75-482* CAN!, DAO!; Bettle's River, 67° N x 150° W,*Jordal 2284* CAN!,US!; Ivishak River, 68° N x 147° W, *Hettinger 657* CAN!; Jag Mt., 69° N x 144° W, *Cantlon & Gillis 57-797* CAN!. California (Mono Co., White Mts., *Morefield & Ross 4695.1* (RSA!). Colorado (Chaffee Co., Mt. Harvard, *Neely & Carpenter 2349* NY!; Clear Creek Co., Mt. McClellan, 19 Aug 1885, *Patterson 154*, NY!,US!, 23 Aug 1892, *Patterson 154*, US 748851! [Hitchcock 1935, fig. 235], Grays Peak, *Shear 690 1/2* US!, *Swallen 1407* US!, *Soreng et al. 2555* NMC!; Gilpin Co., James Peak, *C.F. Cox 491* US!; Gunnison Co., Conundrum Pass, *J. Barrell 70b-55* US; Lake Co., Mt. Elbert, *L. & E. Kelso 5055 & 5059* DAO!; Larimer Co., Longs Peak, *Hitchcock 16278* US!, Longs Peak trail, *Ulke* in 1918 [labeled British Columbia] CAN!; Park Co., Mt. Bross, *Weber et al. 2097* DAO!, Mt. Bross, *E. Hartman & Rottman 2313*; Summit Co., Hoosier Ridge, *Soreng et al. 2548*). Montana (Gallatin Co., Mt. Hyalite, 1 Aug 1902, *Blankinship s.n.* US!, Lava Peak, *Blankinship s.n.* US!; Deer Lodge Co., Mt. Tiny, *Soreng & Spellenberg 1165* NMC!). Utah (Duchesne Co., Uinta Mts., Kings Peak, *Harrison et al. 10070* US!; Grand Co., La Sal Mts., Mt. Waas, *Maguire et al. 16383* CAN!,CU!; San Juan Co., La Sal Mts., Mt. Peal, *Maguire et al. 16384* CU!). Wyoming (Park Co., Abasroka Mts., *Evert 6260*; Teton Co., Two Ocean Mt., *Hitchcock 23172* US!; Yellowstone N.P., Soda Butte, *Tweedy 634* NY!,US!).

U.S.S.R. (Wrangel Island, *Petrovsky & Polozova 6005* DAO!).

*Poa jordalii* A. Pors. was based on plants from the Brooks Range of Alaska. The new species was said to lack a web on the callus, and to be pubescent only on the keel and marginal veins of lemmas. However, most of the material from that region has at least a vestige of a web on calluses of basal lemmas (Fig. 1). The web and intervein puberulence are also variable in occurrence in *P. abbreviata* subsp. *pattersonii* of the U.S. Rocky Mountains (Fig. 1). The only characters that I have found to be correlated with geography are: 1) the hairs of the lemma veins are often shorter (0.10-0.15 mm long), and broadened toward the blunt apex, in Alaskan, Yukon, and British Columbia material, as opposed to always longer (0.3-0.5 mm long), not broadened toward the apex, the apex acute in more southerly material; 2) the panicles of the northern plants are more exerted, average 1 cm shorter, and are more sparsely flowered. However, these differences in hairs and panicles are not consistent enough to warrant subspecific distinctions. Hultén reduced *P. jordalii* to a subspecies, commenting that, "It is the Rocky Mountain counterpart to *P. abbreviata*, and

here regarded as a major race of that species." However, *P. abbreviata* subsp. *pattersonii*, established two years earlier, has priority.

*Poa abbreviata* grades through the *P. jordalii* form toward the closely related *P. lettermanii* Vasey, a more diminutive, yet more commonly occurring species, of similar habitat and range (ranging north to 60° N, British Columbia). *Poa lettermanii* is distinguished from *P. abbreviata* by its lemmas being glabrous or infrequently sparsely puberulent on the base of the keel, shorter (2.5-3.0 mm long), the first and second exceeded in length by both glumes, and anthers being 0.2-0.6 mm long. Its only reported chromosome number, $2n = 14$ (A. Löve, pers. comm.), differs from those reported for *P. abbreviata*. Where the one species stops and the other begins requires closer attention.

3. **Poa arctica** R. Br. subsp. **lanata** (Scribner & Merr.) R.J. Soreng, *comb. et stat. nov.* BASIONYM: *Poa lanata* Scribner & Merr., Contr. U.S. Natl. Herb. 13:72, fig. 16. 1910. TYPE: U.S.A. Alaska: Aleutian Islands, 17 Jul 1899, *Coville & Kearney 2191* (HOLOTYPE: US 376421!).

   *Poa malacantha* V. Komarov, Bot. Mat. (Leningrad) 5(10):148. 1924. TYPE: U.S.S.R. Kamchatka, *Komarov 2832* (LE).

   *Poa komarovii* Rosch., Izv. Glavn. Bot. Sada SSSR, 26(3):286. 1927. TYPE: U.S.S.R. Kamchatka, *Komarov 1080* (LE).

Distribution. CANADA. Alberta, British Columbia, Northwest Territories, Yukon. Outside North America. Far eastern arctic U.S.S.R. U.S.A. Alaska. (map and figs., Hultén 1974).

Applying species rank to *Poa lanata* is unworkable. The few characters (*e.g.*, spikelet size, coloration, and rachilla pubescence) said to distinguish *P. lanata* from *P. arctica* are not correlated or grade continuously between the taxa.

*Poa malacantha*, another taxon in sect. *Poa*, has also been recognized in North America (Hultén 1974; Tzvelev 1983). Tzvelev (1983, English translation) separates *P. malacantha* from *P. lanata* as having "Rachilla almost always somewhat pilose; plants of the Far East [and Alaska], usually forming turf, but often with short creeping underground shoots." versus "Rachilla glabrous; plants [of the northern Far East, including Alaska] with fairly long creeping underground shoots, usually not forming turf." However, these variations and all combinations of them occur in my collections from Alaska and those of UBC, V, and CAN, with no evidence of underlying geographical or ecological pattern. These taxa have almost identical geographic distributions (maps, Hultén 1974). As such, I believe *P. malacantha* to be synonymous with subsp. *lanata*.

KEY TO *POA ARCTICA* SUBSP. *ARCTICA* AND SUBSP. *LANATA*

1. Spikelets mostly greater than 6 mm long; lower lemmas 4.5-6.0 mm long; culm leaf blades often flat and 2-6 mm broad; Far eastern U.S.S.R. CANADA. Alberta, British Columbia, Northwest Territories, Yukon. U.S.A. Alaska. ..... subsp. *lanata*

1. Spikelets less than 6 mm long; lower lemmas 3.0-4.5 mm long; culm leaf blades often folded and less than 2(2.5) mm broad; circumboreal, south to New Mexico in U.S.A. ..... subsp. *arctica* (including: *P. brintnellii* Raup, *P. arctica* subsp. *longiculmis* Hultén, *P. longipila* Nash, and *P. williamsii* Hultén)

4. **Poa cusickii** Vasey subsp. **purpurascens** (Vasey) R.J. Soreng, *comb. et stat. nov.* BASIONYM: *Poa alpina* L. var. *purpurascens* Vasey, *Descr. Cat. Grasses U.S.* 79. 1885. *Poa cusickii* Vasey var. *purpurascens* (Beal) [error for Vasey] C.L. Hitchc., *Vasc. Pl. Pacific Northwest* 1:659. 1969 [(Vasey) C.L. Hitchc. Emend. C.L. Hitchc., *Fl. Pacific Northwest* 659. 1973]. TYPE: U.S.A. Oregon: Mt. Hood, 4000-6000′, Aug 1981, *T. Howell* (HOLOTYPE: US 556826; Isotypes: GH!,ORE!,US 133409!. (map, Soreng 1991.).

Soreng (1991) discussed the nomenclatural problems, morphological variability, and breeding system associated with this taxon and recognized it as *Poa cusickii* Vasey subsp. *epilis* (Scribner) W.A. Weber var. *purpurascens* (Vasey) C.L. Hitchc. The new combination is proposed to be consistent with several floras in progress that restrict the use of more than one infraspecific rank.

5. **Poa laxa** Haenke subsp. **banffiana** R.J. Soreng, *subsp. nov.* TYPE: CANADA. Alberta: Rocky Mountains, vicinity of Sunshine Ski Lodge, south of Healy Creek: Wa-wha Ridge, Standish Hump, alpine slopes and ridges, 7800′, 11 Aug 1945, *Porsild & Breitung 14092* (HOLOTYPE: CAN!) (Fig. 2).

   *Poa laxa* Haenke var. *occidentalis* Vasey *ex* Rydb. & Shear?, U.S.D.A. Div. Agrostol. Bull. 5:32. 1897, *nom. nud.* SYNTYPES: U.S.A. Colorado: Grays Peak, *Shear 690* and *Rydberg 2440.* [Not having seen the types of this recently, I can not be certain of its placement here, but several collections from alpine Colorado with narrow, smooth branched panicles, anthers ca. 0.8 mm long, and extravaginal branching closely approach *P. laxa* subsp. *banffiana*].

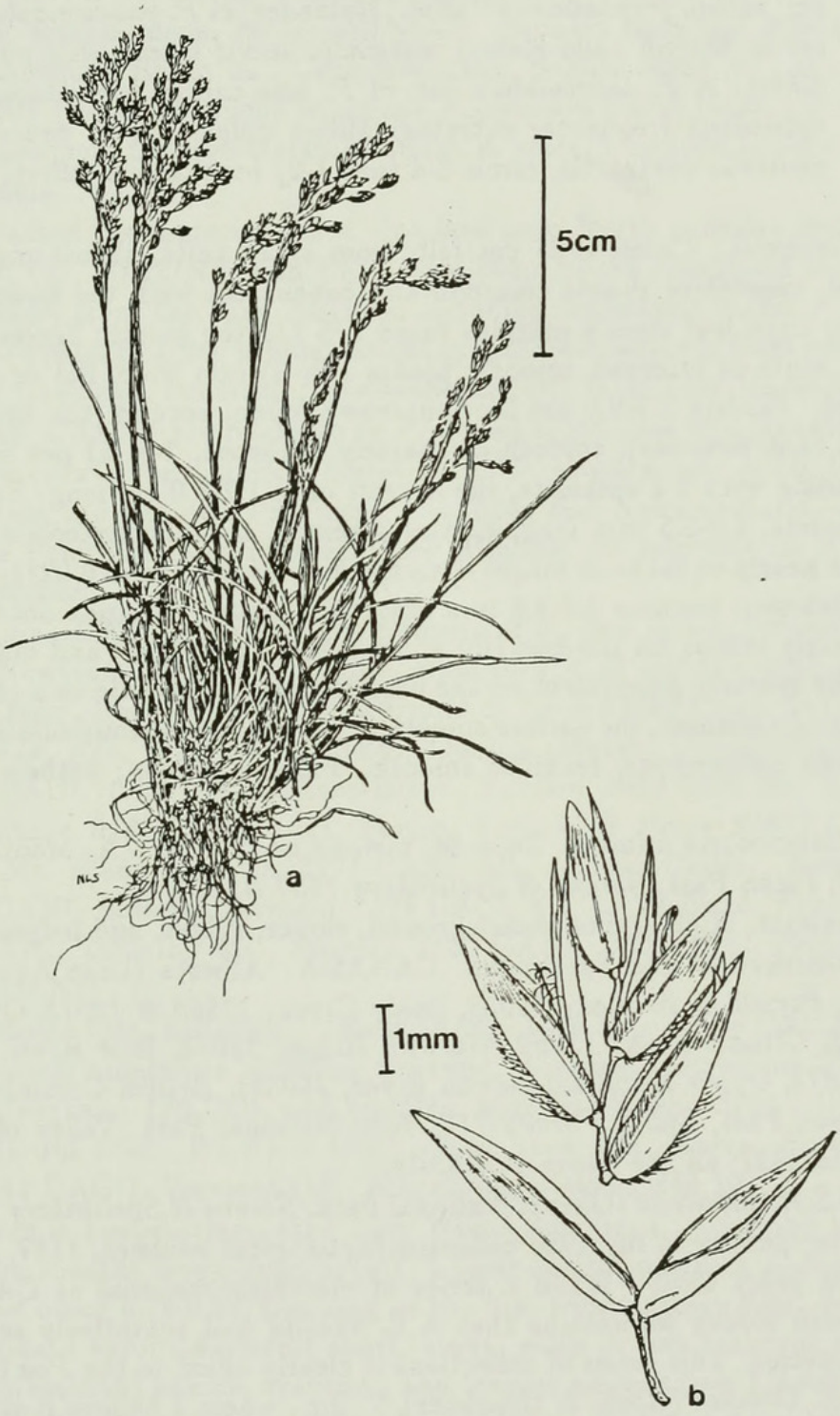


Figure 2. *Poa laxa* Haenke subsp. *banffiana* R.J. Soreng. a. habit (*Porsild & Breitung 14092*; HOLOTYPE: CAN!). b. spikelet (*Porsild & Breitung 13960*).

A *P. laxa* Haenke subsp. *laxa*, subsp. *flexuosa* (Smith) Hylander, subsp. *fernaldiana* (Nannf.) Hylander, et *P. paucispicula* Scribner & Merrill callo glabro, lemmatis nervis intermediis puberulis differt. A *P. abbreviata* s. lat. et *P. laxa* subsp. *fernaldiana* innovationibus frequenter extravaginalibus differt. A *P. paucispicula* paniculis contractis, ramis 2-4 (nec 1-2) brevioribus differt.

Perennial. Culms 8-25 cm tall, from small tufts, shoots mainly extravaginal, vegetative shoots common and concurrent with the flowering shoots. Upper culm leaf sheath margins fused 1/5-1/3 the length; ligules 2.0-3.5 mm long, acute or lacerate, smooth; blades 1-2(-3) mm wide, flat or folded, prow tipped. Panicle 2.5-8.0 cm long, narrowly open, secund, the branches fairly strict (not flexuous), smooth or sparsely scabrous, 2-3(-5) per node, steeply ascending with 2-6 spikelets, the longest ones 1.2-3.0 cm long. Spikelets with 2-5 florets, 4.0-5.5 mm long; glumes 3 veined, broadly lanceolate, the second glume nearly equal to or longer than the first lemma (ratio 0.92/1-1.13/1); callus glabrous; lemmas 3.0-4.6 mm long, lanceolate, the apex obtuse to acute, distinctly villous on the keel (for at least half the length) and marginal veins, usually sparsely puberulent on the base of the intermediate vein of at least one side of the lemmas, the surface smooth or sparsely finely muriculate; palea keels sparsely scaberulous; rachillas smooth. Flowers perfect; anthers 0.8-1.1 mm long.

Chromosome number. $2n = 84$, meiosis normal (U.S.A. Montana: Glacier N. P., Pigan Pass, *Soreng & Spellenberg 1137* NMC).

Habitat. High alpine, moist ground, slopes, ridges, and ledges.

Distribution and Specimens. CANADA. Alberta (Lake Agnes, *Malte* in 1917; *Porsild & Breitung 13029*, Healy Creek, *13508 & 13513*, Quartz Ridge, *13832*, Citadel Peak, *13960*, Wa-wha Ridge, *14092*, Bow River Pass, *14869 & 14873*, Upper N. Saskatchewan River, *16052*). British Columbia (east side Simpson Pass, *Lid & Porsild 717*; Yoho National Park, Valley of Ten Peaks, *Ulke* in 1922; all the above at CAN!).

U.S.A. Montana (Glacier National Park, *Soreng & Spellenberg 1137*, NMC!).

The identity of my 1980 collection/cytological voucher, *1137*, had plagued me for years until I found a series of matching material at CAN from the northern Rocky Mountains that A.E. Porsild had tentatively set aside as a new species. This series of collections is clearly allied to the *Poa laxa* complex of sect. *Oreinos* (Asch. & Graebner) V. Jir., where I believe it is best placed as a new subspecies in *P. laxa*.

The presence of subspecies of *Poa laxa* s. lat. in North America has long been debated. Nannfeldt (1935) excluded subsp. *flexuosa* (Smith) Hylander, and subsp. *laxa* s. str. as strictly European (the former reaching Iceland; the latter strictly continental). He described *P. fernaldiana* Nannf. (*P. laxa* subsp. *fernaldiana*) as the eastern North American counterpart.

Polunin (1959) equivocated on the geographic range, including *Poa pseudoabbreviata* Rosch. within his broad delimitation of the species. Scoggan (1978), citing several maps, recognized subsp. *flexuosa* from the coastal regions of northcentral Baffin Isl., Greenland, and Ungava south to Labrador. Porsild & Cody (map 164, 1980) recognize *P. flexuosa* Smith (with the older *P. laxa* in synonymy) from scattered locations in eastern Canada south to the Gaspe Peninsula.

Having studied the material called *Poa laxa* from North America and Europe at CAN, CU, DAO, NY, and US, I have come to the conclusion that all of their vouchers from the high Nearctic including Greenland called *P. laxa* subsp. *flexuosa* (except a few problematical immature specimens from seepage areas on the Ungavian Peninsula, *Wolsenhome s.n.*, from Port Burwell and Wakeham Bay [CAN!!]) are referable to *P. glauca* s. lat. (see also Nannfeldt's rejection of records in the historical literature for *P. glauca* s. lat.; p. 60, 1935). Specimens from the Atlantic Provinces, Labrador and Newfoundland, south to the Gaspe Peninsula, and northern New England are referable to *P. laxa* subsp. *fernaldiana.*

Distribution and Representative specimens of *P. laxa* subsp. *fernaldiana*: CANADA. Newfoundland (Gros Morne, *Bouchard et al. 84159* CAN!; Highlands of St. John, Deer Pond Brook, *Fernald & Long 27405* CU!). Labrador (Lanse au Clair, *Rev. Waghome* in 1894). Quebec (Matane Co., Mont-Blanc, *Gallo 1125* DAO!, *1128* DAO!, Mont-Blanc, *Swallen 3093* CU!; Mt. Logan, *Fernald & Pease 24873* CAN!, Mt. Fortin, *Fernald & Pease 24873* CAN!; Gaspe Co., Mt. Blanc, *Swallen 3471* CAN!, Mt. Jacques-Cartier, *Raymond et al. 1877* CAN!, *Rolland-Germain 1178* DAO!, Mt. Le Vieillard, *Fernald et al. 25445* CAN!, Tabletop Mt., *Scoggan 1257* CAN!, *1622* CAN!, *Fernald & Collins 162* CAN!).

U.S.A. Maine (Mt. Katahdin, *Allard 5212*!). New Hampshire (Mt. Washington, numerous collections including the type, *Williams & Robinson Plantae Exsiccatae Grayanae 123* CU!, and cp-DNA voucher, *Soreng 3401* CU!; Mt. Lafayette, 31 Jul 1863, *W. Boott* CU!). New York (Mt. Marcy, *Erskins* in 1954, $2n = 42$ DAO!). Vermont (Mt. Mansfield, *Woodward* in 1911).

*Poa glauca* is best distinguished from North American *P. laxa* by its uppermost culm sheaths being open 1/10-1/5 their length; pruinose glumes, the second glume being 0.78-0.97 x as long as the first lemma; more firm, densely, finely muriculate lemma surfaces; short, stout, more or less scabrous angled (occasionally smooth) panicle branches; and longest anthers over 1.2 mm long.

The other three subspecies of *Poa laxa* exhibit a habit and panicle very similar to those of subsp. *banffiana*, but differ by uniformly smooth panicle branches, and presence of a web on the callus, and (in subsp. *fernaldiana*) by predominantly pseudo-intravaginal innovations (*i.e.*, innovations intravaginal in origin, but with a short prophyll and one or more tubular (intravaginal prophylls are not tubular) bladeless leaves below the first leaf with a blade,

as opposed to a long prophyll and no bladeless leaves), and thinner, often filiform, leaves. Although A.S. Hitchcock reports *P. laxa* subsp. *fernaldiana* (*P. fernaldiana*) as lacking a web at the base of the lemmas, I have found a web to be present (though often sparse and short) on at least the lower florets within spikelets of most material.

The new subspecies differs from *Poa pseudoabbreviata* in that the sheaths of the upper culm leaves are open 1/5-1/3 their length; panicle branches are more stout, smooth or only sparsely scabrous, more numerous per node, with more spikelets per branch; lemma pubescence is longer; rachillas are smooth; and anthers are longer. *Poa pseudoabbreviata* has upper culm leaf sheaths open 1/6-1/5 their length; open panicles with distinctly scabrous, elongate, capillary branches bearing 1-2 spikelets; short, 0.05-0.15 mm long lemma pubescence; scabrous rachillas; and anthers 0.2-0.6 mm long (recently revised, and mapped, Cody *et al.* 1990).

Subspecies *banffiana* differs from *Poa paucispicula* in having shorter, more erect, less flexuous panicle branches that are frequently very sparsely scabrous, and have more numerous spikelets, and lemmas sometimes with puberulent intermediate veins (on at least one side) and a glabrous callus. It differs from *P. abbreviata* s. lat. in having panicles more open, with longer, more smooth branches, and high proportion of extravaginal branching.

Subspecies *banffiana* occurs at the southern terminus of the range of *Poa paucispicula*. Porsild & Breitung collected both taxa at Bow River Pass (*14875* and *14874* both *P. paucispicula*, *14873* a mixture of the two taxa) and Quartz Ridge (*13832*). Although subsp. *banffiana* agrees so closely with *P. laxa* that it can not be reasonably distinguished, its characteristics are intermediate between those of *P. paucispicula* and *P. abbreviata*, and further investigation may reveal it to be a stable hybrid between the latter species. One strongly webbed specimen from Oregon, and several webless specimens from Colorado, remain indistinguishable from *P. laxa* except by their more narrow erect panicles, and these could be placed in *P. abbreviata* subsp. *pattersonii* except for their obvious extravaginal innovations and smooth or nearly smooth panicle branches! (Colorado [Clear Creek Co., Grays Peak, 13000′, 15 Aug 1885, *Letterman s.n.* CAN!, Jul 1886, *Letterman 6* US!, Mt. Evans, Summit Lake, 8 Sept 1956, *Weber s.n.* RSA!; Kingston Peak, *Cox 487* US!]. Oregon [Wallowa Mts., *Cusick 2493* CU!,CU!].)

6. *Poa paucispicula* Scribner & Merr., Contr. U.S. Natl. Herb. 13(3):69, fig. 15. 1910. TYPE: U.S.A. Alaska: Yakutat Bay, Hidden Glacier, 20 Jun 1899, *Coville & Kearney 970* (HOLOTYPE: US 376352!).

*Poa merrilliana* A. Hitchc., Amer. J. Bot. 2:309. 1915. *Poa glacialis* Scribner & Merr. [not Stapf. in 1906], Contr. U.S. Natl. Herb.

13(3):68. 1910. TYPE: U.S.A. Alaska: Hubbard Glacier, *Coville & Kearney 1077* (HOLOTYPE: US 376363!).

*Poa merrilliana* was described as lacking a web on the callus, and thus could be confused with the new subspecies *P. laxa* subsp. *banffiana*. The type collection of *P. merrilliana* is immature, but does have a distinct, if somewhat sparse, web, and is otherwise indistinguishable from *P. paucispicula* s. str. Most other material at US labeled or annotated by earlier workers as *P. merrilliana* is referable to *P. pseudoabbreviata*.

7. **Poa secunda** J.S. Presl subsp. **juncifolia** (Scribner) R.J. Soreng, *comb. nov.* BASIONYM: *Poa juncifolia* Scribner, U.S.D.A. Div. Agrostol. Bull. 11:52. pl. 8. 1898. *Poa juncifolia* Scribner subsp. *juncifolia* (autonym), established by Keck *in* C.L. Porter, *Flora Wyom.*, Part 3, Wyoming Agric. Exp. Sta. Bull. 418:22. 1964. TYPE: U.S.A. Wyoming: Sweetwater Co., Point of Rocks, Black Rock Springs, 13 Jul 1897, *Nelson 3721* (LECTOTYPE designated in Hitchcock 1935, fig. 262: US 556860!; Isolectotypes: GH!,NY!,NY!,RM).

*Poa nevadensis* Vasey *ex* Scribner, Bull. Torrey Bot. Club 10:66. 1883. TYPE: U.S.A. in 1877, *Palmer 474* (Isotypes: NY!,NY!). [The geographical origin of this collection, which has been in doubt, may be Red Creek (now Paragonah), Iron Co., Utah, where Palmer collected *474-1/2* in June (25-) July, 1877, (*P. fendleriana* [Steudel] Vasey subsp. *longiligula* [Scribner & T. Will.) R.J. Soreng)]. Scribner mistakenly believed Red Creek to be in Arizona (Scribner & Williams 1899, p. 3) (see MacVaugh 1956). In 1877, Palmer collected in southwestern Utah, southern Nevada, and northwest Arizona, his numbers are sequential-systematic, and there is no record of his collection notes. My supposition here is that *474* was one collection, subsequently split into two halves.

*Poa ampla* Merr., Rhodora 4:145. 1902. TYPE: U.S.A. Washington: Steptoe, *G.R. Vasey 3009* (Isotype: US!).

The only previous application of the rank of subspecies among the approximately 50 taxa currently included in *Poa secunda* s. lat., was by D.D. Keck (1964). He proposed the name *P. juncifolia* subsp. *porteri* Keck, thereby creating the autonym, subsp. *juncifolia*. According to *ICBN* Article 57.3 (Greuter *et al.* 1988), the latter name has priority at this rank within any taxon including the type of *P. juncifolia*, unless an earlier epithet of the same rank is found.

Kellogg's studies (1983, 1985) of *Poa secunda* s. lat. demonstrate the futility of attempting to recognize microspecies in geographically parapatric/ecotonally sympatric, facultatively apomictic complexes. Her well considered conclusion that there is only one species agrees with interpretations of Marsh (1952) and Soreng (1985). This is also consistent with the species concept being applied in other such complexes in *Poa* (Tzvelev 1983; Soreng 1991). However, there is substantial variation within *Poa secunda* s. lat., which is indicated by the recognition of up to thirteen species and subspecies by Keck (unpublished manuscript), and by A.S. Hitchcock's (1935) division of what he called eight species into two groups (*Scabrellae* and *Nevadenses*). The latter concept was more or less retained in the *Vascular Plants of the Pacific Northwest* (Hitchcock *et al.* 1969) and the *Intermountain Flora* (Cronquist *et al.* 1977).

An intermediate solution to what has been done by others is proposed, recognizing the two major variants as subspecies. When the recorded chromosome numbers are graphed there are peaks at $2n = 84$ and $2n = 63$ (Almgard 1960; Armstrong 1937; Bowden 1961; Hiesey & Nobs 1982; Stebbins & Love 1941). [Subsp. *secunda*: $2n$ = 42, 44, 56x2, ca.61, 62, 63x5, 64, 66, 68, 70x4, 72, 74, 78x2, 80, **81x7, 82x6, 83, 84x23, 85x3, 86x5**, 87, 88, 90x2, 91, 93, 94x2*, 98, 99, 104, ca.106 [82% $\geq$ 70]. Subsp. *juncifolia*: $2n$ = 42, 44, 60, **62x7*, 63x29, 64x11**, 65x2, 66, 68x2, 70x3, 78, 84, 96, 97, 100 [87% $\leq$ 68. Two of these counts are new (*, $2n = 63$, Nevada, *Soreng 821*, $2n$ ca. 94; Montana, *Soreng & Spellenberg 1135*). The hexaploid *juncifolia* count ($2n = 42$) was added after reassessment of the identity of the voucher specimen (Soreng 1991)]. The nanaploid and duodecaploid peaks correspond to consistent differences in ecology, anatomy, and gross morphology.

Subspecies *secunda* (including *Poa canbyi* [Scribner] Howell, *P. gracillema* Vasey, *P. incurva* Scribner, *P. sandbergii* Vasey, *P. scabrella* [Thurb.] Benth.) has chromosome numbers centered around $2n = 84$. It usually occurs in well drained soils of low salinity or alkalinity. The basal leaf blades are often thin and wither early, a correlate of having long cells that are fusiform in outline with thin, smooth walls. The lemmas are almost invariably softly to crisply puberulent, though in certain individuals or geographic regions the hairs may be extremely sparse, and easily overlooked. Ligules of leaves on sterile shoots are usually acute or acuminate, greater than 2 mm long, and may be glabrous or scabrous.

Subspecies *juncifolia* has chromosome numbers centered around $2n = 63$. It usually occurs in deep, frequently poorly drained, alkaline or saline, soils. The leaf blades are thickened and persistent, a corollary of having some proportion of the long cells rectangular in outline with more or less thickened sinuous walls. The lemmas are glabrous or scabrous, or rarely sparsely and minutely crisp puberulent across the base (the latter puberulent phase is particularly evident on the high plains east of the Rocky Mountains where the taxon may intergrade with *Poa arida* Vasey). Ligules of leaves on sterile shoots are usually

truncate or obtuse, mostly less than 2 mm long, and scabrous (acute, longer, and sometimes glabrous in *P. nevadensis* Vasey forms).

The substantial discontinuity in morphology is evident in that most collectors have distinguished individuals of these two extremes with reasonable success. They do breed true, and the differences are stable in transplant studies. It is the consistent parapatric to ecotonally sympatric occurrence and high frequency of intermediates between these races (I estimate 10-20%) that makes consistent application of species rank impossible.

8. *Poa secunda* J.S. Presl subsp. *juncifolia* (Scribner) R.J. Soreng x *P. pratensis* L.

*Poa* x *limosa* Scribner & T. Will. (*pro spec.*)., U.S.D.A. Div. Agrostol. Circ. 9:5. 1899. TYPE: U.S.A. California: Mono Lake, 1866, *Bolander* [a rhizomatous plant] (HOLOTYPE: US 748920!).

*Poa* x *fibrata* Swallen (*pro spec.*), J. Wash. Acad. Sci. 30:210. 1940. TYPE: U.S.A. California: Siskiyou Co., Shasta Valley, 3 mi. south of Grenada, 2600′, *Wheeler 3629* (HOLOTYPE: US 1646953!; Isotypes: CAS!,NY!).

Apparent hybrids between *Poa pratensis* and *P. secunda* subsp. *juncifolia* are usually sterile anthered intermediates, and occur over much of the geographic range of overlap of the parents. J.T. Howell first suggested that this may be the origin of *P. fibrata* Swallen (pers. comm.). I have encountered several sites in California and Oregon, including those investigated in a study of in vivo *P. fibrata* for the California Fish & Game Department in 1986, at which both parents and intermediates occur. In addition, I have seen sporadic examples of the nothotaxon from British Columbia and Oregon in herbaria (CAS, OSC, UBC, US, V). Hiesey & Nobs (1982) present ample evidence of the crossing ability of these taxa, and at least temporary stabilization by gametophytic apomixis or vegetative reproduction in $F_1$ hybrids. Occurrence of counterfeit hybridization should not be ruled out (DeWet *et al.* 1984). The hybrids evidently have had multiple origins, and, as in the case of the type and some other localities of *P. fibrata*, they are sometimes ephemeral.

An older name for *Poa fibrata* is *P. limosa* (there may be older names yet, but finding them would require exhaustive search of some 50 types). Rhizomatous plants like *P. limosa* still grow on the western shores of Mono Lake. Rather than apply a nothotaxon epithet, I suggest that these plants be referred to by their hybrid combination.

9. **Poa pratensis** L. [subsp. **alpigena** (Blytt) Hiit.] var. **colpodea** (Th. Fries) R.J. Soreng, *comb. nov.* BASIONYM: *Poa stricta* Lindeb. subsp.

*colpodea* Th. Fries, Ofvers. Forh. Köngl. Svenska Vetensk.-Akad. 26:138. 1869. *Poa alpigena* (Blytt.) Lindman var. *colpodea* (Th. Fries) Scholand., Skr. Svalbard Ishavet 62:89. 1934. *Poa rigens* R. Br. subsp. *colpodea* (Th. Fries) D. Löve, Taxon 17(1):89. 1968. *Poa pratensis* L. subsp. *colpodea* (Th. Fries) Tzvelev, Novosti Sist. Rast. 9:47. 1972. TYPE: Spitsbergen ("Liefdebay").

*Poa alpigena* (Blytt.) Lindman f. *vivipara* Rosch. *in* Komarov [*nom. nud.*], Fl. U.S.S.R. 2:390. 1934.

Tzvelev (1983) recognized the major ecological forms of the *Poa pratensis* complex as subspecies. *Poa pratensis* s. lat. is a compilospecies, including many facultatively apomictic and reticulating lineages. The character combinations defining each of the major forms overlap and are too subtile and poorly documented to maintain species recognition. Variety *colpodea* is a viviparous form of the high arctic islands and coasts. It occurs at the northern edge of the geographic range of subsp. *alpigena* and extends north of that (map. 7, Hultén 1964). This is well north of any other subspecies of *P. pratensis* in the arctic. The possibility that it is a hybrid between *P. arctica* R. Br. and *P. pratensis* subsp. *alpigena*, is being studied (D. Goldman, S. Aiken, J.I. Davis, R.J. Soreng, unpublished data), as is the possibility that vivipary in var. *colpodea* may be a fixed or plastic response of subsp. *alpigena* to the more extreme northern climate. The morphology of the plants, especially of the sometimes normally developed spikelets within panicles, is typical of subsp. *alpigena*, and is here considered, as it has been by most recent authors, a subset of variation within the latter subspecies.

10. **Poa hartzii** R. Br. subsp. **ammophila** (A. Pors.) R.J. Soreng, *comb. et stat. nov.* BASIONYM: *Poa ammophila* A. Pors., Sargentia 4:12. 1943. TYPE: CANADA. Northwest Territories: District of Mackenzie, Cape Dalhousie, 70° 20′ N x 125° 55′ W, forming colonies on sandy hills back of coast, 7-14 Aug 1927, *A.E. Porsild 2704* (HOLOTYPE: CAN!; Isotype: C!) (fig. 143 and map 158, Porsild & Cody 1980.).

Habitat. Arctic, coastal hills, in sandy to clayey soils and stabilized dunes.

Distribution and Specimens. Continental arctic Canada. Northwest Territories, District of Mackenzie, from Darnley Bay and Cape Parry Peninsula west to the Mackenzie River Delta (69° 20′-70° 20′ N x 124°-135° W) (*A.E. & R.T Porsild 2154*, 2311-, 2422*, 2704-, 2827** (all CAN!), *Cody & Ferguson 10363-* DAO!, *Scotter & Zoltai 25592a** DAO! (papillae present = *, absent = -). Porsild & Cody (1980) report it from one collection farther west, in Alaska, but this is probably *Tieszen 854*, which belongs to *Poa hartzii* subsp. *alaskana* R.J. Soreng).

Polunin (1959) and Scoggan (1978) submerged *Poa ammophila* A. Pors. into *P. hartzii*. *Poa hartzii* is a principally Nearctic, high latitude, psammophilic species, occurring on arctic islands from Wrangel Island eastward to Svalbard. Although it is traditionally placed in sect. *Abbreviatae*, its affinities to other species of that section are not strong, and hybrid origins from several different parents have been postulated (Edmondson 1980; Polunin 1959; Tzvelev 1983). Because *P. hartzii* has extravaginal branching, long anthers, somewhat weakly keeled lemmas, and diffuse callus hairs, I suggest it be included in sect. *Secundae* Marsh *ex* R.J. Soreng. (That section may have had a hybrid origin, but it is distinct from sect. *Abbreviatae* s. str.). Unlike most *Poa* (except sections *Andinae* Nicora, *Secundae*, and *Arctopoa* [Griseb.] Tzvelev), *P. hartzii* has villous hairs distributed around the callus and a smooth transition of the callus into the base of the lemma (fig. 3), the plesiomorphic state in the tribe Poeae (Soreng 1990). Most *Poa* have the derived state of hairs arising from the dorsal side of the callus in a single tuft and a slight sulcus on either side of the web origin of the somewhat laterally compressed callus. (The sulcus and compression are also present in derived species that have lost the web.). The almost invariably sterile, early abortive anthers (lacking any pollen), high, dysploid chromosome numbers ($2n$ = 63-70), and lack of obvious morphological variation, in plants from the Canadian Archipelago, arctic coast of Quebec (Cayouette 1984, the first report for the mainland), and Greenland, confirm that *P. hartzii* is predominantly obligately and autonomously apomictic. It has chloroplast-DNA restriction sites diagnostic for *Poa* (R. Soreng, J.I. Davis, & S. Aiken, unpublished data).

Porsild & Cody (1980) maintain that plants from the western continental Canadian arctic are not *Poa hartzii*, but a distinct species, *P. ammophila*. These plants have more normally developed, sometimes pollen bearing anthers (1.5-1.8, vs. aborted and 0.8-1.5 mm long). In addition, they often have papillae on the long cells of the adaxial surface of the leaf blades. They also have shorter ligules (1.5-3.0 mm long), shorter lemmas (3.0-4.6 mm long), elongate rachilla internodes, consistently smooth panicle branches (rarely with a few scabers), a greater tendency to branch intravaginally, and more drab spikelets as compared to *P. hartzii* s. str. (ligules 2-7 mm long, lemmas 3.9-5.3 mm long, panicle branches often scabrous, mixed or predominantly extravaginal branching, and lustrous spikelets). The most consistent characteristics distinguishing subsp. *ammophila* are the lack of hairs on the callus, and the shorter, fine, crisply puberulent hairs of the lemmas (< 0.3 mm long), versus callus hairs present and at least some callus or basal hairs of the lemmas being (0.5-) 0.8-2.0 mm long, and villous. Although the pubescence characteristics are constant elsewhere in the ranges of the two taxa, there is one collection (Porsild's "luxuriant form," *2706* CAN!) from near the type locality of subsp. *ammophila*, which has callus hairs, long lemma hairs, ligules 3 mm long, and lacks papillae. This (and *Parmellee 3214* from 100 km east of the range of subsp. *ammophila*;

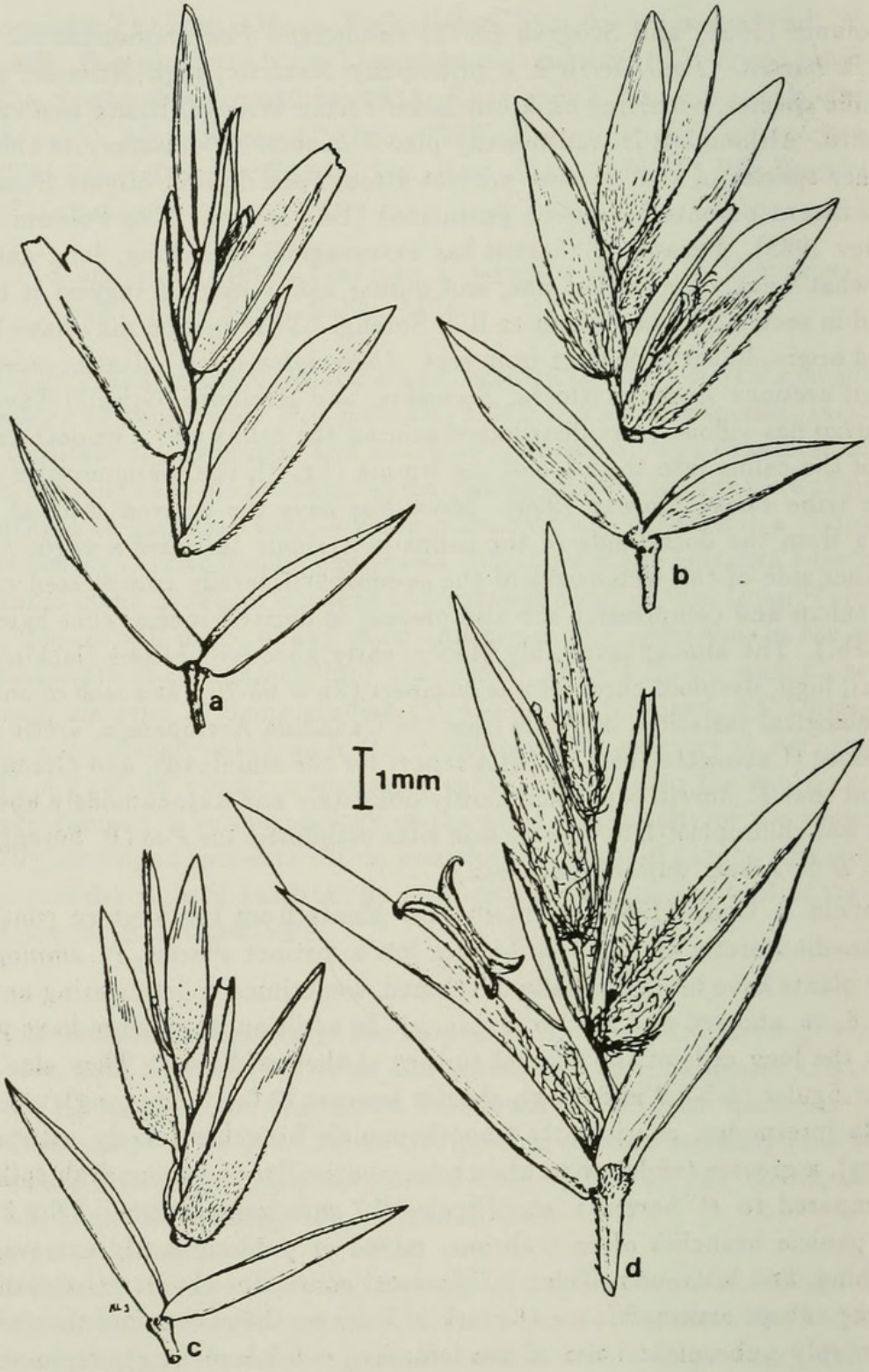


Figure 3. Spikelets of *Poa hartzii* R. Br. subspp. and *P. secunda* J.S.Presl subsp. *secunda*. a. *Poa secunda* subsp. *secunda* (*Corcoran 9*). b. subsp. *hartzii* (*Porsild 18636*). c. subsp. *ammophila* (A. Pors.) R.J. Soreng (*Porsild & Porsild 2154*). d. *P. hartzii* subsp. *alaskana* R.J. Soreng (*Murray & Johnson 7153*; HOLOTYPE: C!).

69° 35′ N x 120° 44′ W), is clearly indistinguishable from typical *P. hartzii* and has caused confusion about recognition of subsp. *ammophila*. With the exception of this one plant, from a possibly mixed or polymorphic population, as *P. hartzii*, there is no problem distinguishing these taxa.

However, an additional problem occurs with regard to inland plants collected from around Great Bear Lake, identified as *Poa ammophila* by Porsild & Cody (1980) (*Porsild 17007*- CAN!, and *Corcoran 9*- DAO!). The Corcoran specimen has quite scabrous branches and a habit typical of *P. secunda* and is best placed in *P. secunda* subsp. *secunda* (also identified by D.D. Keck as *P. canbyi* [= *P. secunda*]). In the absence of papillae on the leaf blades (which are variable in occurrence among plants of subsp. *ammophila* from the coast, but also occur in taxa of *Poa* sect. *Secunda* subsect. *Halophytae* V.L. Marsh *ex* R.J. Soreng), there is no combination of characters by which to distinguish *17007* from subsp. *ammophila* or *P. secunda*. *Poa secunda* s. lat. is usually distinguished from all other *Poa* by having weakly keeled lemmas. Although the Great Bear Lake specimens have weakly keeled lemmas, so do some specimens of coastal subsp. *ammophila* (also noted by Porsild); keels of lemmas of *P. hartzii* s. str. are not always well defined either. The habits of the plants from the arctic coast and Great Bear Lake regions vary considerably, from spreading and tufted as in *P. hartzii* s. str., to erect and tightly tufted as in *P. secunda*. *Poa secunda* is native as far north as 63-64° N in eastern Alaska, the Yukon and western District of Mackenzie, directly south of the range of subsp. *ammophila*, and often reaches into the alpine. Whether *P. secunda* is native at Great Bear Lake (Sawmill Bay, 65° 43′ N, *Corcoran 9*) is not known, but it is entirely possible that its range extends farther north than currently known, into the Mackenzie River delta. Eventually subsp. *ammophila* may be proven to be a hybrid between *P. secunda* and *P. hartzii*.

11. **Poa hartzii** R. Br. subsp. **alaskana** R.J. Soreng, *subsp. nov.* TYPE: U.S.A. Alaska: 70° 45′ N, 156° 30′ W, Mead River, forming tufts in sand dunes of point bars, 4 Aug 1980, *D. Murray & Johnson 7153* (HOLOTYPE: C! plant no. 1 [no. 2 = *Deschampsia caespitosa* (L.) Beauv. subsp. *brevifolia* (R. Br.) Tzvelev]; Isotype: ALA) (Fig. 4).

A *P. hartzii* R. Br. subsp. *hartzii* et subsp. *ammophila* (A. Pors.) R.J. Soreng lemmatibus 5.5-7.0 mm longis, et rhachillis 1.5-2.0 mm longis, differt.

Perennial; hermaphroditic; cespitose, or becoming stoloniferous in sandy soils. Culms loosely tufted, 20-45 cm tall, innovations intra and extravaginal. Upper culm leaf sheath margins fused 1/7-1/5 the length; ligules 5-7 mm long, smooth to sparsely scabrous abaxially; blades 1-3 mm wide, firm, folded and

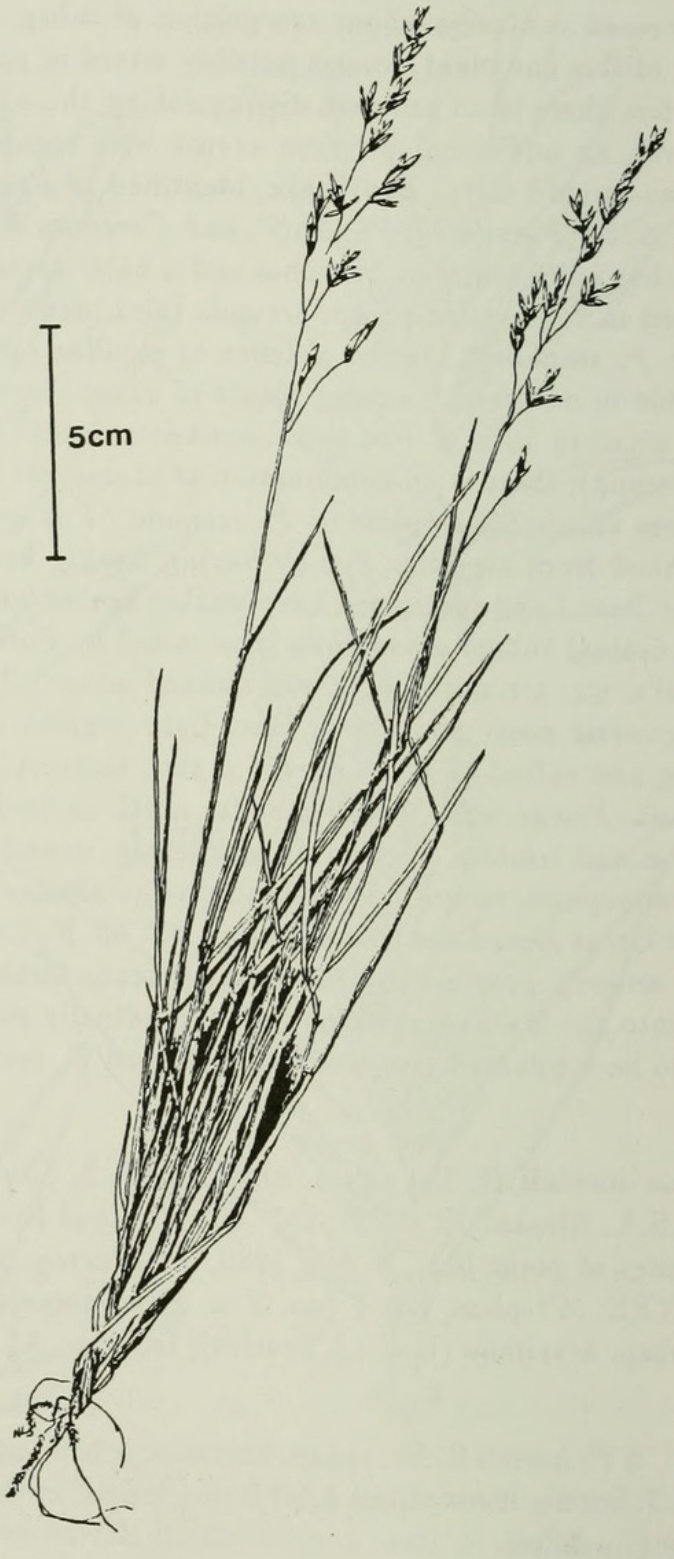


Figure 4. *Poa hartzii* R. Br. subsp. *alaskana* R.J. Soreng habit (*Murray & Johnson 7153*; HOLOTYPE: C!).

inrolled on the margins, smooth abaxially, more or less scabrous to hispidulous adaxially on and between the veins, lacking papillae. Panicle 7-12 cm long, lanceolate, the branches smooth to moderately scabrous, sulcate. Spikelets with 3-5 florets, 5-7 mm long; glumes broadly hyaline, 3 veined, the second glume frequently exceeding the lower lemma; callus with villous hairs 1-2 mm long around the base; lemmas 5.5-7.0 mm long, thin, sparsely villous on the keel and marginal veins and between them, the margins broadly hyaline; palea keels sparsely scabrous to pilose below; rachillas glabrous or sparsely villous, the longest internodes 1.5-2.0 mm long. Flowers perfect; anthers 2.2-2.8 mm long, appearing fertile.

Habitat. High arctic coastal plain, in sands along inland waterways, 100-ca. 850 m.

Distribution and Specimens. U.S.A. Alaska: north slope (Mead River, vicinity of Atkasook village, 70° 39′ N, 157° 15′ W, *Murray & Johnson 7153* ALA,C!, *Komarkova & Duffy 595* COLO, west side of river, 10 mi. north of Atkasook village, in sand dunes, 16 Aug 1959 (1953?), *Cantlon 4763* CAN!, *4782* CAN!; Mead River delta, *Rothe 45* ALA; Lake Peters [2800′, 69° 20′ N, 145° 02′ W], up Bear Creek, late snow area in moss bed [roots sandy], 3 Aug 1966, *Tieszen 854* CAN!). (I have not seen the ALA or COLO specimens, which are cited from location data sent by D. Murray.).

Plants of *Poa hartzii* from the Mead River, northwest Alaska, and Lake Peters, northeast Alaska, are distinguished as subsp. *alaskana*. These are robust (20-45 cm tall), stoloniferous, principally intravaginally branching, have ligules 5-7 mm long, and well developed, pollen bearing anthers 2.0-2.5 mm long. David Murray independently noted some of these distinctions (unpublished manuscript). Plants of subsp. *hartzii* have mostly abortive (empty) anthers, less than 1.5 mm long, ligules 2-5 mm long, shorter stature (15-25 cm tall), a cespitose habit, and proportionally more extravaginal branching. In addition, the Alaskan plants have abundant callus hairs about 2 mm long, and longest lemmas and rachilla internodes that are longer than in subsp. *hartzii* (5.5-7.0 and 1.5-2.0 mm long, versus 3.9-5.3 and 0.8-1.5 mm long, respectively). Like specimens of subsp. *hartzii* checked, the Alaskan plants lack papillae on the leaf blades. The best characters to discriminate between these geographically isolated populations and other *P. hartzii* are fully developed versus early abortive anthers, and the slightly larger looser habit and more vigorous growth of the spikelets. These characters quite likely will be found to overlap. The Alaskan plants may be merely sexually reproducing populations within an otherwise predominantly, obligately apomictic species. The degree of morphological differentiation is consistent with recognition at the subspecific level.

12. *Deschampsia caespitosa* (L.) Beauv. subsp. *brevifolia* (R. Br.) Tzvelev *in* Tolmachev, *Fl. Sev.-Vost. Europ. Chasti SSSR* 1:141. 1974.

    *Poa evagens* Simmons, Report Second Norw. Arctic Exped. in the Fram 1898-1902. Kristiana 2:165-166. 1906. TYPE: CANADA. Ellesmerlandiae meridionalis, Fram Fjord 76° 23′ N, 81° 30′ W, *Simmons 4267* (LD!).

The name *Poa evagens* has been applied to material of *P. hartzii* subsp. *hartzii* and subsp. *ammophila* by several botanists. An examination of the type specimen of *P. evagens* by myself and S. Aiken revealed that the taxon belongs to *Deschampsia*, not *Poa*; the early deciduous awns probably having contributed to the confusion.

The following infrageneric taxa in *Poa*, proposed by Soreng (1991), are emended here. Three were incorrect according to the *ICBN* (Greuter *et al.* 1988). Subgeneric taxa other than those that include the type of the genus in which they are described, are not autonymic; each rank, even though repetition of the epithet is recommended, is independent of those in which they are included and must be separately validated (see Articles 6.8, 57 and extensions thereof). Thus taxa 14 and 17 need their types and authors repeated. Creation of new subgeneric taxa also requires that the genus be explicitly stated in the protocol (Articles 21.1 and 37). Taxa 13, 15, and 16, but not 14, 17 and 18, were validated by their usage in text and tables in Soreng (1991).

13. *Poa* L. subgen. *Poa* sect. *Madropoa* R.J. Soreng, Syst. Bot. 16(3):512-513. 1991. TYPUS: *Poa piperi* A. Hitchc.

14. **Poa** L. subgen. **Poa** sect. **Madropoa** R.J. Soreng subsect. **Madropoa** R.J. Soreng, Syst. Bot. 16(3):513. 1991. TYPUS: *Poa piperi* A. Hitchc. Emend.

15. *Poa* L. subgen. *Poa* sect. *Madropoa* R.J. Soreng subsect. *Epiles* A. Hitchc. *ex* R.J. Soreng, Syst. Bot. 16(3):512-513. 1991. TYPUS: *Poa epilis* Scribner.

16. *Poa* L. subgen. *Poa* sect. *Secundae* V.L. Marsh *ex* R.J. Soreng, Syst. Bot. 16(3):513, 523. 1991. TYPUS: *Poa secunda* J.S. Presl.

17. **Poa** L. subgen. **Poa** sect. **Secundae** V.L. Marsh *ex* R.J. Soreng subsect. **Secundae** R.J. Soreng, Syst. Bot. 16(3):523. 1991. TYPUS: *Poa secunda* J.S. Presl. Emend.

18. **Poa** L. subgen. **Poa** subsect. **Halophytae** V.L. Marsh *ex* R.J. Soreng, Syst. Bot. 16(3):523. 1991. TYPUS: *Poa unilateralis* Scribner. Emend.

## ACKNOWLEDGMENTS

Thanks are extended to Nancy Soreng for the illustrations, Susan Aiken, Jerrold Davis, and Melissa Luckow for careful readings of the manuscript, Susan Aiken for providing live material of arctic *Poa* and assisting me in the annotation of most of the CAN *Poa*, Rupert Barneby for help with the Latin, David Murray for comments on the Alaskan taxa, John Strother for help with nomenclature, David Keck for his annotation lists of *Poa*, the curators of C, CAN, CU, DAO, LD, NY, RSA, UBC, US, and V for loans of specimens consulted in this study, and Vernon Leroy Marsh, wherever he may be, for his dissertation on *Poa*.

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