

S. angustifolium, *S. fallax*, *S. fuscum*, *S. magellanicum*, *S. rubellum*, *Polytrichum commune*, and *P. juniperinum*. It can be distinguished from most other red species of sect. *Acutifolia* with which it co-occurs by its lack of 5-ranking in the branches. *Sphagnum subtile* is a forest and non-hummock forming species that has a distinctly shorter and more triangular-lingulate stem leaf. The stem leaf border on *S. subtile* is also more strongly bordered. *Sphagnum tenerum*, which geographically overlaps *S. capillifolium* only very minimally, has much more turgid branches and a generally more robust look. The stem leaf of *S. tenerum* is triangular-lingulate as compared to the lingulate-triangular stem leaf of *S. capillifolium*. See also discussion under 84. *S. subnitens* and 87. *S. tenerum*.

The names *Sphagnum acutifolium* Schrader and *S. nemoreum* Scopoli (doubtful name) have also been used for this taxon.

72. *Sphagnum fimbriatum* Wilson & Hooker in J. D. Hooker, Fl. Antarct., 398. 1847 [F]



Plants typically small and slender, larger and compact in the Arctic, capitulum small to moderate-sized, often with a conspicuous terminal bud; green, yellowish brown to brown; without metallic lustre when dry. **Stems** pale green to straw-colored; superficial cortical with a large round pore

in distal portion of cell free from cell wall. **Stem leaves** spatulate to broad-spatulate, 0.8–1.5(–2) mm, strongly lacerate across the broad apex and often part way down the margins, border scarcely to strongly broadened at base (0.25 width of base or less); hyaline cells rhomboid, efiibrillose and often 1–2-septate. **Branches** not 5-ranked, quite terete, long, and slender **Branch fascicles** with 1–2 spreading and 1–2 pendent branches. **Branch leaves** ovate to ovate-lanceolate; 1.1–1.5(–2) mm, slightly concave, straight; apex involute; margins entire; hyaline cells on convex surface with numerous pores along the commissures grading from small pores near leaf apex to large pores at base, concave surface with large round pores at leaf apex and along margins. **Sexual condition** often monoicous. **Spores** 20–27 μm , finely papillose on both surfaces; proximal laesura less than 0.5 spore radius.

Subspecies 2 (2 in the flora): North America, South America, Eurasia, Pacific Islands (New Zealand).

1. Plants small and slender, capitulum small and with a conspicuous terminal bud; stem leaves fimbriate down the sides and weakly to moderately bordered at the base 72a. *Sphagnum fimbriatum* subsp. *fimbriatum*
1. Plants moderate-sized and compact, capitulum moderate sized and lacking a conspicuous terminal bud; stem leaves entire down the sides and strongly bordered at the base 72b. *Sphagnum fimbriatum* subsp. *concinnum*

72a. *Sphagnum fimbriatum* Wilson & Hooker subsp. *fimbriatum*



Sphagnum bolanderi Warnstorff

Plants typically small and slender; capitulum small and with a conspicuous terminal bud; green to yellowish brown. **Stem leaves** broad-spatulate, 0.8–1.5(–2) mm, strongly lacerate across the broad apex and partway down the sides, border scarcely to moderately

broadened at leaf base (0.25 width of base or less). **Sexual condition** monoicous. **Spores** 20–27 μm , finely papillose on both surfaces; proximal laesura less than 0.5 spore radius.

Capsules mature late spring and early summer. Minerotrophic, common at the mineral soil margins of bogs and poor fens, medium open and forested fens; low to high elevations; Alta., B.C., Man., N.B., Nfld. and Labr. (Nfld.), N.S., Ont., Que., Sask.; Alaska, Calif., Colo., Conn., Del., Idaho, Ill., Ind., Iowa, Ky., Maine, Md., Mass., Mich., Minn., Mo., Mont., N.H., N.J., N.Y., Ohio, Oreg., Pa., R.I., Tenn., Vt., Wash., W.Va., Wis.; South America; Eurasia; Pacific Islands (New Zealand).

Sporophytes are very common in subsp. *fimbriatum*. It is associated with *Sphagnum centrale*, *S. fallax*, *S. henryense*, *S. affine*, *S. palustre*, *S. russowii*, *S. teres*, *S. warnstorffii*, and *Drepanocladus exannulatus*. It is normally very easily recognizable because of its very small size, pale green color, and distinct terminal bud. In Alaska it overlaps with subsp. *concinnum*, which has a similarly very broad and lacerate stem leaf apex but the lacerate margin does not extend down the sides of the leaf. Subspecies *concinnum* is also a more compact-growing taxon with a distinctly browner color.

72b. *Sphagnum fimbriatum* subsp. *concinnum* (Berggren) Flatberg & Frisvoll, J. Hattori Bot. Lab. 56: 308. 1984 [F]

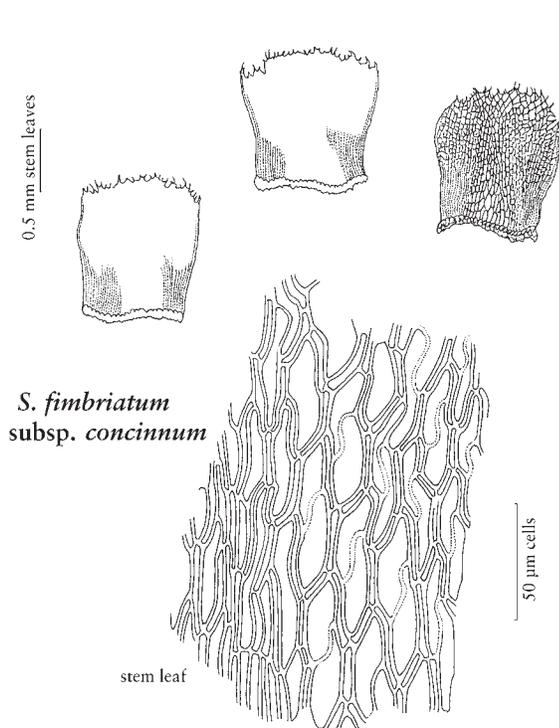


Sphagnum teres var. *concinnum* Berggren, Kongl. Svenska Vetensk. Acad. Handl., n. s. 13(7): 94. 1875; *S. fimbriatum* var. *arcticum* C. E. O. Jensen; *S. fimbriatum* var. *concinnum* (Berggren) Warnstorff

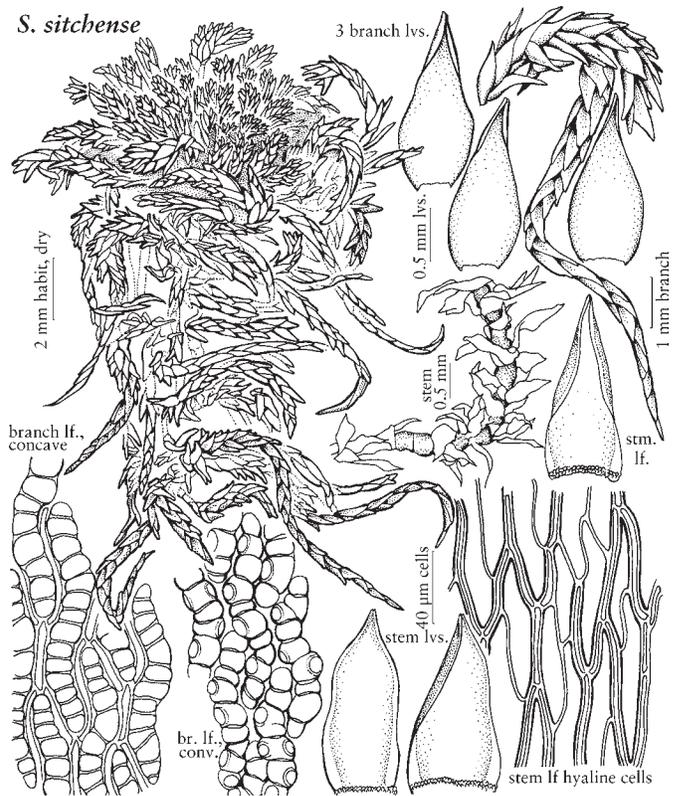
Plants moderate sized and stiff; capitulum moderate-sized and dense golden brown to brown.

Stem leaves spatulate, 0.95–1.1 mm, lacerate across the broad apex and entire down the sides, border strongly bordered at the leaf base. **Sexual condition** unknown.

Forming dense carpets and low hummocks in poor fen tundra peatlands; low to moderate elevations;



SPHAGNUM



Greenland; N.W.T., Nunavut, Que., Yukon; Alaska; Eurasia.

73. *Sphagnum flavicomans* (Cardot) Warnstorf in
H. G. A. Engler, *Pflanzenr.* 51[III]: 79. 1911 [E]



Sphagnum acutifolium var.
flavicomans Cardot, *Rev. Bryol.* 11:
55. 1884; *S. plumulosum* var.
flavicomans (Cardot) A. L. Andrews;
S. subnitens var. *flavicomans*
(Cardot) Warnstorf; *S. subnitens* var.
obscurum Warnstorf; *S. subnitens*
var. *viride* Warnstorf

Plants normally robust, sometimes moderate-sized, stiff and erect, capitulum large and typically hemispherical, usually deep reddish brown, frequently with a faint metallic purplish sheen when dry. **Stems** dark reddish brown; superficial cortical cells aporose. **Stem leaves** narrowly triangular-lingulate, 1.5–2 mm, apex right-angled to apiculate, border moderately strong and greatly broadened at the base (more than 0.25 width); hyaline cells rhombic, 0–1-septate, normally fibrillose near apex. **Branches** not 5-ranked, terete, long and tapering. **Branch fascicles** with 2 spreading and 1–2

pendent branches. **Branch leaves** ovate-lanceolate, 1.5–2.3 mm, straight, concave, apex strongly involute; margins entire; hyaline cells on convex surface with elliptic pores along the commissures, grading from moderate-sized pores near leaf apex to large pores at leaf base, concave surface with large round pores in proximal marginal regions of leaf. **Sexual condition** dioicous. **Spores** 27–32 µm, finely papillose on both surfaces; proximal laesura less than 0.5 spore radius.

Capsules mature early to mid summer. Ombrotrophic to weakly minerotrophic and hygrophytic, forming hummocks on margins of ponds and in poor fens where some shade is available and carpets in wet forests along coast; low to moderate elevations; N.B., Nfld. and Labr. (Nfld.), N.S., P.E.I., Que.; Conn., Del., Maine, Md., Mass., N.H., N.J., N.Y., N.C., Pa., R.I., Va.

The sporophytes of *Sphagnum flavicomans* are uncommon. It is associated with *S. cuspidatum*, *S. papillosum*, *S. rubellum*, *S. pulchrum*, and *S. torreyanum*. This species is the ecological replacement for *S. fuscum* in much of the Atlantic coastal plain; compared to that species, *S. flavicomans* is substantially more robust and has a larger stem leaf with a more pointed apex. See also discussion under 83. *S. subfulvum*.

74. *Sphagnum fuscum* (Schimper) H. Klinggraff,
Schriften Phys.-Ökon. Ges. Königsberg 13: 4. 1872



Sphagnum acutifolium var. *fuscum*
Schimper, Mém. Hist. Nat.
Sphaignes, 64. 1857; *S. tenuifolium*
Warnstorff; *S. vancouveriense*
Warnstorff

Plants small and slender, stiff and usually compact, capitulum small and flat-topped; typically deep reddish brown, also greenish

brown in shaded habitats and in early seasonal growth, without metallic lustre when dry. **Stems** dark reddish brown; superficial cortical cells aporose. **Stem leaves** lingulate, 0.8–1.3 mm; apex broadly rounded and entire to lacerate, sometimes slightly mucronate or slightly denticulate; hyaline cells rhombic, 0–1(–2)-septate, usually efihrillose. **Branches** long and slender to short and compact, unranked to 5-ranked. **Branch fascicles** with 2 spreading and 1–2 pendent branches. **Branch leaves** ovate-lanceolate, 1.1–1.3 mm, straight, concave, apex strongly involute; margins entire, hyaline cells on convex surface with round to elliptic pores along the commissures, grading from small pores near the leaf apex to large pores near the base, concave surface with large round pores in proximal marginal regions of leaf. **Sexual condition** dioicous. **Spores** 17–30 µm, finely papillose on proximal surface and pusticulate on distal surface; proximal laesura less than 0.5 spore radius.

Capsules mature late summer. Mires, hummocks, fens; low to high elevations; Greenland; Alta., B.C., Man., N.B., Nfld. and Labr. (Nfld.), N.W.T., N.S., Nunavut, Ont., P.E.I., Que., Sask., Yukon; Alaska, Calif., Colo., Conn., Idaho., Ill., Ind., Maine, Md., Mass., Mich., Minn., Mont., N.H., N.J., N.Y., N.C., Ohio, Oreg., Pa., R.I., Utah, Vt., Va., Wash., W.Va., Wis., Wyo.; Eurasia.

Sphagnum fuscum is common in ombrotrophic mires and alpine mountain summits where it may form small to large hummocks to 1 m in height, more infrequently in weakly minerotrophic mires and richer fens.

Sporophytes are common in *Sphagnum fuscum*, which is associated with *S. angustifolium*, *S. fallax*, *S. magellanicum*, *S. papillosum*, and more infrequently with *S. teres*, and *S. warnstorffii* in richer sites. Very widespread but generally easily recognized, it is the only small brown hummock-forming species of sect. *Acutifolia* over most of its range. There are some significant variations in this species. The stem leaves can vary from having a rounded, entire apex to having a somewhat flat and lacerate apex. The branches also vary from being unranked and slender to 5-ranked and blunt. The color also can vary from a light to a dark brown. There does not seem, however, to be any consistent pattern to these variations and thus no taxonomic recognition has been given to them. See also discussion under 73. *S. flavicomans*.

75. *Sphagnum girgensohnii* Russow, Beitr. Torfm., 46.
1865



Sphagnum mehneri Warnstorff

Plants moderate-sized to robust, open, very stiff and slender, less frequently compact, capitulum large, flat, and stellate; typically deep green in shaded sites to yellowish brown in more open sites; without metallic lustre when dry. **Stems** pale green to yellow-

brown; superficial cortical cells with a single large round pore in distal portion of cell usually free from cell wall. **Stem leaves** lingulate, broadly lingulate to lingulate-spatulate; 0.8–1.3 mm, apex broad, truncate and lacerate, border broad at base (more than 0.25 of base); hyaline cells rhomboid, efihrillose, and rarely septate. **Branches** typically long and tapering, not 5-ranked. **Branch fascicles** with 2 spreading and 1–2 pendent branches. **Branch stem** with solitary retort cells or in groups of 2–3, necks moderately distinct. **Branch leaves** ovate to ovate-lanceolate, 1–1.4(–1.8) mm, concave, straight, apex strongly involute, margins entire; hyaline cells on convex surface with numerous elliptic pores along the commissures, grading from small pores near the apex to large pores near the base, concave surface with large round pores along the margins and base. **Sexual condition** dioicous. **Spores** 21–27 µm, moderately to coarsely papillose on both surfaces; proximal laesura less than 0.5 spore radius.

Capsules mature late summer. Shade tolerant, forming carpets on moist forest floors, along small streams, up through subalpine zone; low to high elevations; Greenland; Alta. B.C., Man., N.B., Nfld. and Labr. (Nfld.), N.W.T., N.S., Nunavut, Ont., P.E.I., Que., Sask., Yukon; Alaska, Calif., Colo., Conn., Idaho., Ill., Ind., Maine, Md., Mass., Mich., Minn., N.H., N.J., N.Y., N.C., N. Dak., Ohio, Oreg., Pa., R.I., Tenn., Vt., Va., Wash., W.Va., Wis.; Eurasia.

Sporophytes are uncommon in *Sphagnum girgensohnii*. This species is most frequently associated with *S. russowii*, but also found growing with *S. centrale*, *S. fallax*, *S. fimbriatum*, *S. warnstorffii*, and *S. magellanicum* when growing in shaded sites of mires. It is very similar to *S. rubiginosum*, but *S. girgensohnii* lacks any reddish pigments, has only 2 spreading branches per fascicle, infrequently produces sporophytes, and differs in spore morphology. Throughout much of its range, *S. girgensohnii* is readily recognized by its green color and its large, slender, strongly stellate capitulum. In the more northern portion of its range, it frequently forms compact stands with a golden brown color and then the stem leaf must often be examined for accurate identification. In

Alaska it overlaps morphologically with *S. fimbriatum* subsp. *concinnum*, which can look very similar but will have a more spatulate stem leaf that is lacerate completely across the broad flat apex and slightly down the sides. *Sphagnum girgensohnii*, on the other hand, has stem leaves only lacerate for about $\frac{3}{4}$ of the apex width and less conspicuously broadened at the apex.

76. *Sphagnum junghuhnianum* Dozy & Molkenboer, Verh. Kon. Akad. Wetensch., Afd. Natuurk. 2: 8. 1854



Sphagnum junghuhnianum subsp. *pseudomolle* (Warnstorff) H. Suzuki; *S. pseudomolle* Warnstorff

Plants moderate-sized, soft, loosely tufted, slender, capitulum flat-topped to rounded; pale, dirty green, yellowish to brownish; without metallic lustre when dry.

Stems brown to reddish brown; superficial cortical cells usually aporose, but some have a single round to elliptical pore in the distal portion of the cell free from the cell wall. **Stem leaves** triangular-lanceolate, 1.2–1.6 mm, broadly apex acute to narrowly truncate and toothed, border narrow or indistinct at base (less than 0.25 the width); hyaline cells rhomboid, mostly 0–1-septate; convex surface with membrane pleats, concave surface with 1–3 rounded membrane gaps occupying most of cell. **Branches** somewhat 5-ranked. **Branch fascicles** with 2 spreading and 1–2 pendent branches. **Branch leaves** ovate-lanceolate, 1.3–2 mm, strongly concave, apex strongly involute; margins entire to somewhat toothed near apex, hyaline cells on convex surface with numerous ringed elliptic pores (6–10) along commissures, concave surface mostly aporose except near margins; **Sexual condition** dioicous or monoicous. **Spores** 21–23 μm ; minutely papillose.

Shady, seepy cliffs; low elevations; B.C.; e Asia.

Sphagnum junghuhnianum in the flora area is known only from the Queen Charlotte Islands.

Sporophytes of *Sphagnum junghuhnianum* were not seen. Three other large, brown species of sect. *Acutifolia* have stem leaves without fimbriate to lacerate apices, *S. subnitens* (forms without red color), *S. subfulvum*, and *S. flavicomans*. *Sphagnum flavicomans* has a more pointed stem leaf and a darker brown color as well as a strongly different ecology and range. Both *S. subnitens* and *S. subfulvum* have a glossy sheen when dry that is lacking in *S. junghuhnianum*. Sexual condition and spore characters were taken from H. A. Crum (1984).

77. *Sphagnum molle* Sullivant, Musc. Allegh., 205. 1846



Sphagnum labradorensis Warnstorff; *S. tabulare* Sullivant

Plants moderate-sized, soft and lax when wet, stiff when dry, typically very compact, capitulum flat and usually large; pale whitish, yellowish or purplish, occasionally a deep purple-red; without metallic sheen when dry. **Stems**

pale green to straw-colored; superficial cortical cells aporose. **Stem leaves** quite variable in shape, elongate-lanceolate to ovate, broadest above the middle, 1.9–2.5 mm, slightly concave, straight; apex broad and toothed; hyaline cells narrowly rhomboid, 0–1-septate, distal portion fibrillose, convex surface with membrane pleats, concave surface with 1(2–3) oblong membrane gaps. **Branches** rarely 5-ranked. **Branch fascicles** with 2 spreading and 1–2 pendent branches. **Branch leaves** ovate, 1.6–2.2 mm, concave, straight; apex stiffly involute and broadly truncate with up to 8 teeth, border denticulate due to cell wall resorption and projecting cell walls; hyaline cells strongly bulging on convex surface and nearly plane on the concave surface, convex surface with narrowly elliptic pores along commissures grading from smaller pores near the apex to large rounded pores at base, concave surface with large round pores in proximal regions of leaf. **Sexual condition** monoicous. **Spores** 27–33 μm , finely papillose on both surfaces with distinct bifurcated Y-mark sculpture on distal surface; proximal laesura less than 0.5 spore radius.

Capsules mature early to mid summer. Weakly minerotrophic and hygrophytic, poor fens and sand dunes, forming tight cushions among grasses and sedges in savannas, pine barrens, swamps, pond margins, and ditches where periodic dessication is common; low to high elevations; Nfld. and Labr. (Labr.); Ala., Del., Fla., Ga., Ky., La., Maine, Miss., N.J., N.Y., N.C., S.C., Tex., Va.; Europe.

The sporophytes of *Sphagnum molle* are common. This species is usually easily distinguished from other red species of sect. *Acutifolia* by its relatively large, straight, loosely spreading and unranked branch leaves. *Sphagnum tenerum*, the other red species of sect. *Acutifolia* to which it is most similar, has branch leaves that are quite imbricate. Microscopically, the denticulate-margined branch leaves are unmistakable.

78. *Sphagnum quinquefarium* (Lindberg) Warnstorf,
Hedwigia 25: 222. 1886



Sphagnum acutifolium var.
quinquefarium Lindberg in R.
Braithwaite, Sphagnac. Europe, 71.
1878; *S. schofieldii* H. A. Crum

Plants moderate-sized, typically stiff and compact, capitulum usually hemispherical; green, grayish white, pale yellow, purplish red, may have a slight

metallic luster when dry. **Stems** pale green or yellowish, rarely red-tinged; superficial cortical cells mostly aporse, but some cells may have a single oval to elliptic pore-like wall thinning in the distal portion of the cell. **Stem leaves** triangular to triangular-lingulate, 1–1.3 mm, apex acute to slightly obtuse, border broad at base (more than 0.25 width); hyaline cells narrowly rhomboid, mostly 0–1-septate and mostly efrilliose. **Branches** usually strongly 5-ranked. **Branch fascicles** with mostly 3 spreading and 1–2 pendent branches. **Branch leaves** ovate to ovate-lanceolate, 1.1–1.5 mm, concave, straight, apex slightly involute; hyaline cells on convex surface with numerous oval to elliptic pores along commissures grading from small pores near apex to large round pores at base, concave surface with large round pores in proximal portions of leaf. **Sexual condition** monoicous or dioicous. **Spores** 19–27 μm , finely papillose on proximal surface, pustulate on distal surface; proximal laesura less than 0.4 spore radius.

Capsules mature mid summer. Weakly minerotrophic and hydrophytic, wet mineral bedrock, damp coniferous humus along coast and in montane regions; low to high elevations; B.C., Man., N.B., Nfld. and Labr. (Nfld.), N.S., Ont., Que.; Alaska, Conn., Ga., Maine, Md., Mass., Minn., N.H., N.Y., N.C., Pa., Tenn., Vt., Va., W.Va.; Eurasia.

Sporophytes are common in *Sphagnum quinquefarium*. This species is usually associated with *S. capillifolium*, *S. girgensohnii*, and *S. russowii*. No other species of sect. *Acutifolia* has the combination of quinquefarious branch leaves and three spreading branches per fascicle. *Sphagnum rubiginosum* has three spreading branches but the branch leaves are quite unranked and its lingulate stem leaf is quite distinct from the triangular stem leaf of *S. quinquefarium*. See also discussion under 86. *S. talbotianum*.

79. *Sphagnum rubellum* Wilson, Bryol. Brit., 19. 1855



Sphagnum acutifolium var. *tenellum*
Schimper; *S. capillaceum* var.
tenellum (Schimper) A. L. Andrews;
S. capillifolium var. *tenellum*
(Schimper) H. A. Crum

Plants small to moderate-sized, slender, fairly stiff but soft, capitulum flat-topped and stellate; deep maroon-red to variegated red

and yellowish green, lacking metallic sheen when dry. **Stems** red, yellowish or pale green; superficial cortical cells aporse. **Stem leaves** lingulate-triangular to lingulate, 1–1.4 mm, apex broadly rounded but becoming acute in hemiisophyllous forms, border strongly developed at base (more than 0.25 width); hyaline cells rhombic and 0–3-septate with some cells in leaf midregion 2-septate. **Branches** weakly to strongly 5-ranked. **Branch fascicles** with 2 spreading and 1–2 pendent branches. **Branch leaves** ovate to ovate-lanceolate, 0.9–1.2 mm, concave, subsecund on some branches, apex involute; hyaline cells on convex surface with numerous round to elliptic pores along the commissures, grading from small round pores near apex to round pores near base, on concave surface with large round pores in proximal portions of leaf. **Sexual condition** dioicous. **Spores** 18–33 μm , coarsely papillose on both surfaces; proximal laesura less than 0.4 spore radius.

Capsules mature mid summer. Poor fens and ombrotrophic mires, forming extensive carpets and hummocks; low to high elevations; Greenland; B.C., N.B., Nfld. and Labr. (Nfld.), N.W.T., N.S., Ont., P.E.I., Que., Yukon; Alaska, Conn., Ill., Ind., Maine, Md., Mass., Mich., Minn., N.H., N.J., N.Y., N.C., Ohio, Oreg., Pa., R.I., Vt., Wash., Wis.; Eurasia.

Sporophytes are uncommon in *Sphagnum rubellum*. This common species is associated with *S. angustifolium*, *S. capillifolium*, *S. fallax*, *S. fuscum*, *S. magellanicum*, *S. papillosum*, *S. recurvum*, and *S. tenellum*. Inland, it has a greater tendency to form extensive carpets and floating mats than hummocks. See also discussion under 65. *S. andersonianum*, 68. *S. bartlettianum*, and 86. *S. talbotianum*.

80. *Sphagnum rubiginosum* Flatberg, Lindbergia 18:
61. 1993



Plants slender to moderately robust, capitulum flat-topped to somewhat convex, terminal bud rather conspicuous, slightly to distinctly stellate; green to variegated green and brown-red to red-brown, lacking metallic sheen when dry. **Stems** pale or pale with red-brown portions particularly during late autumn; superficial cortical cells mostly with

one ± circular to transversely elliptical pore close to distal cell wall, occasionally superficial cells with 2(–3) pores with most occupying more than half the cell width. **Stem leaves** broadly lingulate-spathulate to spatulate, widest at base and/or distal third, usually narrower in the mid region, 1–1.3 mm, apex narrowly to broadly truncate and ± fimbriate-lacerate, border narrow distally and expanded proximally to 0.25 width or more; hyaline cells e fibrillose, irregularly rhombic to subquadrate, many cells 2–4-septate. **Branches** unranked. **Branch fascicles** with 3(4–5) spreading branches and 1–2 pendent branches. **Branch leaves** ovate-lanceolate, 1.1–1.4 mm, slightly concave, straight, apex involute; hyaline cells on convex surface grading from aporose to few small round pores near apex to numerous semi-elliptic pores along commissures in middle and base of leaf, concave surface with a few large irregular to circular pores (1–4) occupying most of the cell width. **Sexual condition** autoicous. **Spores** 20–27 μm, moderately granulate-papillose on both surfaces, distinct raise Y-mark sculpture on distal surface; proximal laesura less than or equal to 0.5 spore radius.

Capsules mature mid to late summer. Shaded areas in humid, spruce forests; low to moderate elevations; B.C., Nfld. and Labr. (Nfld.); Alaska, Wash.; Europe.

The sporophytes of *Sphagnum rubiginosum* are common. The geographic distribution is unclear because of the species' recent description and possible confusion with *S. girgensohnii*. It is clearly distinct from *S. girgensohnii* in coloration, number of spreading branch fascicles, the common occurrence of sporophytes (rarely found with *S. girgensohnii*, and spore morphology. The conspicuous three spreading branches will separate this from all species of sect. *Acutifolia* except *S. quinquefarium*. The latter has 5-ranked branch leaves, while those of *S. rubiginosum* are unranked.

81. *Sphagnum russowii* Warnstorf, Hedwigia 25: 225. 1886



Sphagnum acutifolium var. *robustum* Russow

Plants ± moderate-sized, stiff and open, compact on exposed sites, capitulum flat-topped and often stellate; green or variegated red and green, lacking metallic sheen when dry. **Stems** typically mixed green and red; superficial cortical

cells mostly rectangular and uniporose with a single round to ovate pore in distal portion of cell usually free from cell wall, some cells and occasionally whole stems may be aporose. **Stem leaves** lingulate, 1.3–1.6 mm, apex broadly rounded or pointed and notched (sometimes denticulate), border strong and broadened at base (more than 0.25 width); hyaline cells short sinuoid-rhombic,

mostly e fibrillose, 0–1(–2)-septate. **Branches** long and slender, never 5-ranked. **Branch fascicles** with 2 spreading and 1–2 pendent branches. **Branch leaves** ovate-lanceolate, 1.3–1.6 mm, concave, straight, apex strongly involute; hyaline cells on convex surface with numerous round to elliptic pores along the commissures, grading from small round pores near the apex to large elliptic pores at the base, concave surface usually with large round pores throughout, but sometimes restricted to proximal portions of leaf. **Sexual condition** dioicous, but some specimens apparently monoicous. **Spores** 18–33 μm, coarsely papillose on both surfaces; proximal laesura more than 0.5 spore radius.

Capsules mature late spring to early summer. Minerotrophic and shade-tolerant, common on the margins of mires, open portions of poor to rich fens, up through timberline in montane regions in wet coniferous forests; low to high elevations; Greenland; Alta., B.C., Man., N.B., Nfld. and Labr. (Nfld.), N.W.T., N.S., Nunavut, Ont., P.E.I., Que., Sask., Yukon; Alaska, Calif., Colo., Conn., Del., Idaho, Ill., Ind., Iowa, Maine, Md., Mass., Mich., Minn., Mo., Mont., N.H., N.J., N.Y., N.C., Ohio, Oreg., Pa., R.I., Tenn., Utah, Vt., Va., Wash., W.Va., Wis., Wyo.; Eurasia.

Sporophytes are uncommon in *Sphagnum russowii*. This species is associated with *S. centrale*, *S. fallax*, *S. fimbriatum*, *S. girgensohnii*, and *S. squarrosum*. Because of its not particularly distinct phenotype as well its strong tendency to produce hemiisophyllous stem leaves, *S. russowii* is probably the most frequently misidentified *Sphagnum* species. The combination of the flat, stellate capitulum, unranked branch leaves, and lingulate stem leaf will usually suffice to identify it. *Sphagnum capillifolium* has a rounded capitulum and a pointed stem leaf while *S. subtile* also has a rounded capitulum but a shorter and more triangular stem leaf. In montane and arctic mires it can be confused with *S. warnstorffii* but the latter usually has conspicuously 5-ranked branch leaves. As one might expect in such a widespread and common species, the characters can vary considerably. For example, one regularly finds plants that are consistent in every respect with the description except that they lack stem cortical pores. Some stem leaves have almost no septations in the hyaline cells while other forms have most of the cells septate. As with similar variation in the likewise common *S. fuscum*, there is no consistent pattern and so taxonomic recognition of the variants is unwarranted.

82. *Sphagnum sitchense* R. E. Andrus, Sida 22: 969, figs. 27–34. 2006 [E] [F]



Plants moderate-sized; capitulum flat-topped and dense; pale yellow and pink, lacking sheen. **Stem** pink, superficial cortical cells aporose. **Stem leaves** narrowly triangular to lingulate-triangular, 1.2–1.6 × 0.6–0.8 mm, length: width ratio ca. 2:1, apex apiculate, border strong and moderately

broadened basally; hyaline cells narrowly rhomboid and 1 to occasionally 2 septate, often fibrillose apically. **Branches** not 5-ranked. **Branch fascicles** with 2 spreading and 1 pendent branch. **Branch leaves** 1.3–1.5 × 0.5–0.55 mm, ovate-lanceolate, concave, straight, apex involute; hyaline cells on convex surface with numerous round to elliptic pores along the commissures, grading from large elliptical pores at the base to moderate-sized round pores at the apex, concave surface with a few large round pores scattered throughout. **Sexual condition** unknown.

Known only from type locality where it was forming low dense hummocks in alpine tundra; moderate elevations; Alaska.

83. *Sphagnum subfulvum* Sjörs, Svensk Bot. Tidskr. 38: 404. 1944



Sphagnum nitidum Warnstorff, Allg. Bot. Z. Syst. 1: 94. 1895

Plants moderate-sized to robust, usually soft and lax, sometimes moderately stiff, capitulum typically enlarged and flat-topped, ± stellate; green to golden brown, unshaded plants often reddish purple, plants with metallic sheen

when dry. **Stems** yellowish to dark brown; superficial cortical cells aporose. **Stem leaves** triangular-lingulate to broadly lingulate, 0.9–1.3 mm, apex broadly rounded to obtusely angled, border very strong and broad at base (more than 0.4 width); hyaline cells rhombic, efibrillose, most 0–1-septate. **Branches** long, tapering, imbricate, not 5-ranked. **Branch fascicles** with 2 spreading and 1–2 pendent branches. **Branch leaves** ovate, 2–2.5 mm, concave, straight, apex involute; hyaline cells on convex surface with elliptic pores along the commissures grading from moderate-sized pores near leaf apex to large pores at the base, concave surface with large round pores in proximal portions of leaf. **Sexual condition** monoicous. **Spores** 23–31 μm, irregularly coarsely papillose on both surfaces; proximal laesura less than or equal to 0.5 spore radius

Capsules mature early summer. Minerotrophic and hygrophytic, forming hummocks in shrubby and wooded medium and rich fens; low to moderate elevations; Greenland; B.C., Nfld. and Labr. (Nfld.), Ont., Que., Yukon; Alaska, Maine, Mich., Minn., N.H., N.J., N.Y., Vt.; Eurasia.

Sporophytes of *Sphagnum subfulvum* are common. This species is associated with *S. centrale*, *S. contortum*, *S. teres*, and *S. warnstorffii*. Although it is normally more minerotrophic, *S. subfulvum* does occasionally (in Newfoundland) occur in the same mires as *S. flavicomans*. The latter lacks the metallic sheen of *S. subfulvum* and its stem leaves are not as narrow and acute. In some forms *S. subfulvum* may develop a purplish gloss that may lead to confusion with *S. subnitens* but the color of that species has a definite red component and its stem leaves are narrower and more sharply pointed than those of *S. subfulvum*.

84. *Sphagnum subnitens* Russow & Warnstorff, Verh. Bot. Vereins Prov. Brandenburg 30: 115, plate 3, fig. 9, plate 4, figs. 22, 23. 1888 [F]



Plants moderate-sized, relatively robust, smaller in exposed sites, elongated in shaded sites, soft, capitulum ± large; pale green, green, yellowish, yellow-brown, brown, pinkish, purplish; with strong metallic sheen when dry. **Stems** brown or purplish; superficial cortical cells aporose.

Stem leaves triangular to triangular-lingulate, 1.2–1.7 mm, apex acute to sometimes shortly cuspidate due to involute margins near apex, border narrow at base (less than 0.25 width); hyaline cells mostly efibrillose and aporose, 0–1(–2)-septate. **Branches** long and tapering, unranked. **Branch fascicles** with 2 spreading and 1–2 pendent branches. **Branch leaves** 1.3–2.7 mm, ovate to ovate-lanceolate, 1.3–2.7 mm, concave, straight, apex involute; hyaline cells on convex surface with 2–6 large, narrowly elliptic ringed pores along the commissures, but usually absent from marginal regions of leaf, concave surface aporose or with 1–4 large round pores per cell especially near base. **Sexual condition** monoicous. **Spores** 22–32 μm, finely to irregularly coarsely papillose on proximal surface, irregularly coarsely papillose on distal surface; proximal laesura less than 0.5 spore radius.

Capsules mature early summer. Coastal oceanic mires that range from weakly to moderately minerotrophic; low to moderate elevations; B.C.; Alaska, Calif., Oreg., Wash.; Eurasia; Pacific Islands (New Zealand).

Sporophytes are common in *Sphagnum subnitens*. The ecology of this species is unclear because of past taxonomic confusion with *S. subfulvum*. However, the two clearly differ in gametophyte and spore morphology