

FISSIDENS ARCTICUS BRYHN IN RUSSIA

FISSIDENS ARCTICUS BRYHN В РОССИИ

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Abstract

Fissidens arcticus Bryhn is found in Russia from three localities in Taymir Peninsula and Yamal Peninsula. Its diagnostic characters and the differentiation from *F. bryoides* is discussed. Description and ecological characteristics are provided.

Резюме

Fissidens arcticus Bryhn выявлен в России из трех местонахождений на п-ове Таймыр и п-ове Ямал. Приводятся описание, рисунки, экологическая характеристика вида. Обсуждаются диагностические признаки *F. arcticus* и его отличия от *F. bryoides*.

Fissidens arcticus was described in 1906 by Bryhn from the Ellesmere Island, Canadian Arctic Archipelago. Later some specimens of this species were collected in Alaska, Arctic Canada and Greenland. Steere and Brassard (1974) provided the detailed description of *F. arcticus*, list of its localities and the map of its distribution in the North America. In Svalbard *F. arcticus* has been reported for the first time by Frisvoll (1981).

The taxonomic status of *F. arcticus* remains debatable. Steere (1978) wrote that characters differing *F. arcticus* from *F. bryoides* eventually depend on environmental conditions and that *F. arcticus* may be a form of the extremely variable *F. bryoides*, growing in unfavorable conditions. Frisvoll (1981) doubted in independence of *F. arcticus* as a separate species too, and suggested to consider its as a variety of *F. bryoides*. Nyholm (1986) accepts *F. arcticus* as a good species and provides its description and illustrations. Frisvoll later changed his opinion and considered *F. arcticus* as a separate species (Frisvoll, Blom, 1992; Frisvoll, Elvebakk, 1996). *F. arcticus* is listed in "Red Data Book of European Bryophytes" (1995) as "vulnerable". In the latter publication its distribution is described as including Alaska, Arctic Canada, Greenland and Svalbard. Recently Kannukene & Matveye-

va (1996) reported *F. arcticus* from the Taymir Peninsula.

In the course of revision of the Yamal collection of the genus *Fissidens* in LE 2 specimens of *F. arcticus* were found. Thus, 3 localities of *F. arcticus* are known in Russia at present (Fig. 1). These collections confirm the opinion of Steere and Brassard (1974) that *F. arcticus* has a circumpolar arctic distribution. Description of the specimens from the Yamal Peninsula is provided below.

Fissidens arcticus Bryhn, Rep. 2. Norweg. Arct. Exp. Fram. 2, 1907 Fig. 2

Stems erect, unbranched, 2-6 mm high, rhizoids few, brownish. Leaves 4-10 pairs, erect, lanceolate, acute; nerve ending below or in apex. Upper leaves 1.2-1.5 mm long, 0.3-0.4 mm wide, ratio A/V (apical lamina length/vaginal lamina length) 1:1.3-2.5, dorsal lamina often non reaching stem, border in apical and dorsal laminae consist of one row of cells, partially absent or fragmentary, in vaginal lamina border broad, usually intramarginal, consist of 4-7 rows of cells, often yellowish or brownish. Middle leaves 0.9-1.2 mm long, 0.25-0.35 mm wide, dorsal lamina usually non reaching stem, border in apical and dorsal laminae mostly absent, rarely fragmentary developed. Lower leaves 0.5-0.9 mm long, 0.2-0.3 mm wide, vaginal lamina weak, always non reaching stem, border in apical and

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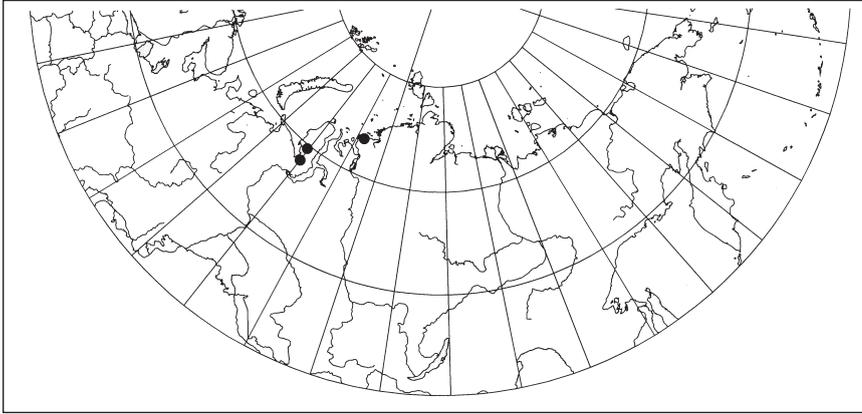


Fig. 1. Distribution of *Fissidens arcticus* Bryhn in Russia.

dorsal laminae absent, in vaginal lamina very broad, occupies to 30-50% width of leaf base. Leaf cells pellucid, smooth, irregularly quadrate, rectangular to hexagonal, (8)10-14 μm in diameter, thick-walled.

Synocious. Sporophytes terminal, solitary. Seta stout, 2-3 mm long; capsula erect, symmetric, 0.6-0.7 mm long; lid conic to shortly rostrate; peristome single, teeth red to orange-brownish, papillose. Spores 16-20 μm , finely papillose to smooth.

Specimens examined. West Siberian Arctic, Yamal Peninsula: Lower Erkutayaha River, Tabortato Lake (68°08'N, 69°05'E), Chernyadjeva #32, 21.VII.1994 (LE); Middle Sebayakha River (69°37'N, 69°27'E), Chernyadjeva #12, 28.VII.1992 (LE).

Habitat. On bare clay spot on polygonal tundra, separate stems among *Bryoerythrophyllum recurvirostre* (Hedw.) Chen (Sebayakha River). On bare sandy soil in nival grass association with *Lophozia perssonii* Buch et S. Arnell (Erkutayaha River). *Lophozia perssonii* is found for the first time in West Siberian Arctic (determined by A. Potemkin).

Fissidens arcticus is very close to *F. bryoides*. Inflorescence type, degree of the leaf border and dorsal lamina expression allow to differentiate these species (Tabl. 1). The identified specimens of *F. arcticus* are synocious, whereas the studied specimens of *F. bryoides* are autoicous, with antheridia in bud-like branches in leaf axils.

The leaf border of *F. arcticus* in apical and dorsal laminae is often lacking or fragmentary developed; it is broad and frequent pigment-

ed in vaginal lamina. The border of *F. bryoides* is different: it is strong, disappears some distance below the leaf apex or confluent with the nerve in plants studied from Chukotka, Arctic East Siberia, Polar Urals. The border is weak, often indistinct in apical part of the specimens from the Yamal Peninsula. In general, the border of *F. arcticus* is weaker in apical and dorsal laminae, and stronger developed in vaginal lamina, than *F. bryoides*.

The degree of development of dorsal lamina is the other important character. The dorsal lamina in both specimens of *F. arcticus* as a rule ends somewhat above the leaf base. In the investigated specimens of *F. bryoides* the dorsal lamina of well-developed leaves reaches the base of leaf, though in separate leaves of some specimens dorsal lamina not reaching the stem.

Areolation of upper leaf is an additional character. In *F. bryoides* they often form diagonal rows from nerve towards border. This character was noted also by Corley (1980). However in *F. arcticus* these rows are not clear.

Nyholm (1986), Steere and Brassard (1974) pointed on specific intramarginal border of *F. arcticus*. However Frisvoll (1981) mentioned that the similar border occur in *F. bryoides* as well. My observation also found intramarginal border in many plants of *F. bryoides*, so this character is not a valid one for the differentiation of *F. arcticus* and *F. bryoides*.

Nyholm (1986) considered, that ratio A/V is a key character for differentiation of *F. arcticus* from *F. bryoides*. In plants studied the ratio A/V of well-developed leaves is 1:1.1-2.3

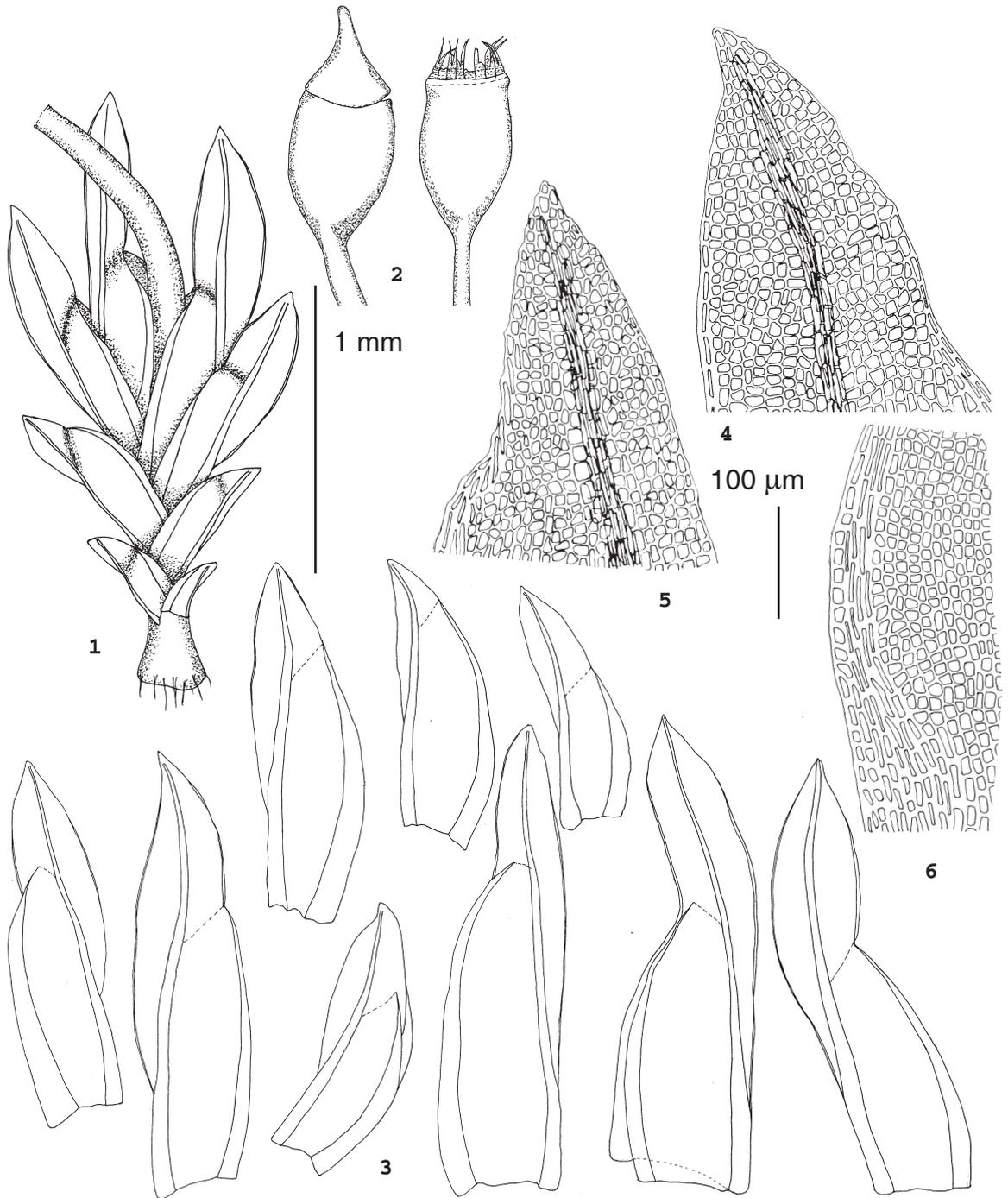


Fig. 2. *Fissidens arcticus* Bryhn (from Czernyadjeva, #32): 1 – habitat; 2 – capsules; 3 – leaves; 4-5 – upper laminal cells; 6 – basal leaf cells. Scale bars: 1 mm for 1-3, 100 μm – for 4-6.

Table 1. Comparison of Russian plants of *Fissidens arcticus* and *F. bryoides*

Species	inflorescence	border in apical and dorsal lamina	type of dorsal lamina
<i>F. arcticus</i>	synoicous	lacking to fragmentary	ending above leaf base
<i>F. bryoides</i>	autoicous	strong to fragmentary	reaching leaf base

in *F. bryoides* and 1:1.3-2.5 in *F. arcticus*. Thus, this character also is not a helpful one for the differentiation of these taxa.

Thus, different sex distribution, the opposite tendencies of border development and weak development of dorsal lamina persuades me now to keep *F. arcticus* separate from *F. bryoides*. However the degree of taxonomic isolation of

F. arcticus requires further investigation.

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