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**DIDYMODON GIGANTEUS (POTTIACEAE, BRYOPHYTA)  
IN CHUKOTKA**

**DIDYMODON GIGANTEUS (POTTIACEAE, BRYOPHYTA)  
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Two specimens of *Didymodon giganteus* (Funck) Jur., originally identified as *D. asperifolius*, were found in the collections from Chukotka (Asian Arctic) in LE. The records represent new localities of *D. giganteus* in Russia. The species was previously known only from a single record in the lower course of the Lena River (Arctic Yakutia). We provide the morphological description, illustration, and habitat data for the new Russian records of *D. giganteus* and summarize the world distribution.

**Keywords:** mosses, *Pottiaceae*, *Didymodon*, Chukotka, Asian Arctic, distribution.

В ходе ревизии коллекций мхов по роду *Didymodon*, хранящихся в ботаническом гербарии LE, среди образцов, собранных на Чукотке (Азиатская Арктика), были обнаружены два образца *D. giganteus*, определенные ранее как *D. asperifolius*. Это второе местонахождение вида на территории России, ранее он был известен только из низовьев р. Лены (Арктическая Якутия). Приводятся морфологическое описание вида, иллюстрации, сведения по экологии и распространению.

**Ключевые слова:** мхи, *Pottiaceae*, *Didymodon*, Чукотка, Азиатская Арктика, распространение.

*Didymodon giganteus* (Funck) Jur. is a Holarctic, broadly distributed moss with the distribution centre in the European Alps. It was described in 1832 from two localities in the Austrian Alps under the name *Barbula gigantea*. With respect to its strongly collenchymatous cells with sinuose wall-thickenings, Schimper (1860) transferred it to the genus *Grimmia* Hedw. and later he even established a new genus, *Geheebia* Schimp., to accommodate this morphologically outstanding species (Schimper, 1876).

The current placement in the genus *Didymodon*, which is followed in the «Check-list of mosses of East Europe and North Asia» (Ignatov et al., 2006) goes back to J. Juratzka (1882). Within the genus, the species was attributed to sect. *Fallaces* (De Not.) R. H. Zander (Zander, 1993), which has been confirmed in the molecular study by O. Werner et al. (2005).

The only record of *Didymodon giganteus* for Russia has been based on a specimen collected by H. Nilson-Ehle in Kumakh-Surt at the lower course of the Lena River (Arnell, 1913) and kept in LE. This specimen was sent to LE as a duplicate of the type collection of *Mollia tortuosa* var. *arctica* Arnell [*Tortella arctica* (Arnell) Nyholm]. However, L. Savicz-Lyubitskaya (Савич-Любицкая, 1961) studied the specimen and found that it contained only a mixture of *Didymodon giganteus* and *Trichostomum arcticum* Kaal. (*T. cuspidatissimum* Cardot et Thér.). This problem was subsequently discussed by Crundwell and Nyholm (1963), who confirmed that the original collection of *Mollia tortuosa* var. *arctica* comprised a mixture of the three above mentioned taxa that was unevenly divided and distributed among various herbaria.

In course of the revision of *Didymodon* collections in LE by the first author (JK), two specimens of *Didymodon giganteus*, originally identified as *D. asperifolius* (Mitt.) H. A. Crum et al. were found in the material from Chukotka (Wrangel Island and Krause Cape on Chukotka Peninsula). These finds represent two distant new localities of the species in Russia. The morphological description and illustration based on the material from Chukotka are provided.

***Didymodon giganteus*** (Funck) Jur., Laubm.-Fl. Oesterr.-Ung., 102. 1882. — *Barbula gigantea* Funck, Flora 15: 483. 1832. — *Geheebia gigantea* (Funck) Boulay, Musc. France, Mousses: 395. 1884. — *Didymodon levieri* Broth., Nuovo Giorn. Bot. Ital., n. s. 13: 256. 1906. — *D. sub-rufus* Broth., Symb. Sin. 4: 38. 1929. — Fig.

Plants medium-sized, in rather dense tufts, orange-brown in upper part, brownish in lower part. *Stems* 4.0–5.0 cm long, erect, irregularly branched, sparsely radiculose at base, covered by branched, brown, smooth rhizoids, rounded-angular in transverse section, hyalodermis absent, cortical cells in 2–3 layers, with reddish brown, strongly thickened walls; medullar cells yellowish, thick-walled, central strand present, small. *Leaves* more or less appressed and crisped when dry, spreading or weakly recurved when moist, elliptic-lanceolate, 2.2–2.5 × 0.75–0.80 mm, sharply keeled distally, from ovate-elliptic, widely decurrent base gradually narrowing to the apex; apex narrowly acute, not fragile; margins broadly recurved in lower  $\frac{1}{3}$ – $\frac{3}{4}$  of leaf, entire, sometimes ir-

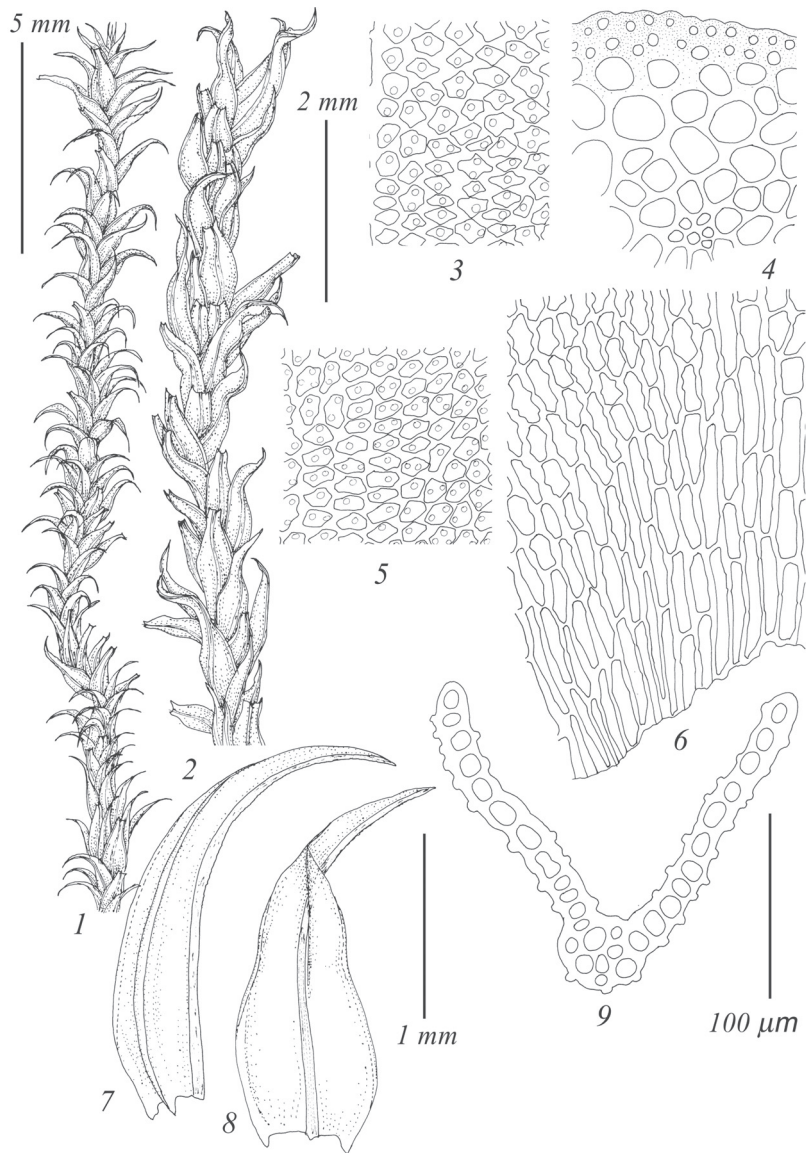


Fig. *Didymodon giganteus*  
(Chukotka, Wrangel Island, 22.07.1985, Afonina, LE).

1 — habit, wet; 2 — habit, dry; 3 — upper leaf cells; 4 — stem transverse section; 5 — median leaf cells; 6 — basal leaf cells; 7, 8 — leaves; 9 — leaf transverse section. Scale bars: 1 — 5 mm; 2 — 2 mm; 3–6, 9 — 100 μm; 7, 8 — 1 mm.

regularly distantly weakly undulate in distal part; *costa* reddish, percurrent, 60–80  $\mu\text{m}$  at leaf base, slightly projecting dorsally, with elongate and smooth ventral surface cells and elongate and papillose dorsal surface cells, in transverse section with 2–4 guide cells in 1 row, well-developed dorsal stereid band and weak ventral stereid band not extending to the upper part of leaf; lamina unistratose; distal lamina cells irregular in shape, small, 12–15(17)  $\times$  10–12  $\mu\text{m}$ , lumina angular (stellate), walls irregularly thickened and porose, with 1–3 blunt papillae, basal lamina cells rectangular, smooth, longitudinal walls thickened, porose, toward margins shorter and more thick-walled. Gametangia and sporophytes unknown in Russia.

**Differentiation.** *Didymodon giganteus* is most closely related and very similar to *D. maximus* (Syed et Crundw.) M. O. Hill. The latter species differs in the less markedly thickened upper and median leaf cells, which leave the cell lumen more rounded, the basal leaf cells have less markedly sinuous walls. The leaves of *D. maximus* are not transversely undulate but they are more apparently squarrose when wet. Particularly in stunted plants from extreme alpine or arctic conditions the differences might however be rather subtle. *D. ferrugineus* (De Not.) M. O. Hill and *D. erosodenticulatus* (Müll. Hal.) K. Saito also differ in the markedly squarrose, non-undulate leaves in wet conditions, the leaf cells have no stellate lumina or sinuous wall thickenings. Moreover, *D. erosodenticulatus* has distally toothed leaf margins.

**Ecology.** In Chukotka *D. giganteus* was collected in a nival calcareous mossy tundra with willows and in a calciphilous moss community on a rocky slope. It is a calciphilous moss growing in mountainous areas. In the Alps this species grows mostly on calcareous rocks or ledges covered with wet humus, sometimes even directly in calcareous fens. The hygrophilous nature of its localities looks less pronounced in the Arctic, which however represents an extreme habitat.

**Distribution.** Russia: Yakutia (lower course of the Lena River), Chukotka (Wrangel Island and Krause Cape on Chukotka Peninsula). Worldwide distribution: Europe (Alps, French Pyrenees, Carpathians) (Ochyra et al., 1990), North America (Alaska, British Columbia, Northwest Territories) (Zander, 2007), Asia (Sikkim, southern and central China, Japan) (Li Xing-jiang et al., 2001), Africa (O’Shea, 2003). The current distribution area of the species probably resulted following the vegetative propagation from the Himalayan region to the Holarctic during the Quaternary. The probable Himalayan origin of the species is supported by the fact that only in this region the sporophytes have been recorded (Sollman, 2005).

Specimens examined. Siberia, in valle flum. Lena, Kumachsur, 70°30' m lat. bor. Ad rivulum in monte calcareo, 31.07.1898, H. Nilsson-Ehle (S, LE). Chukotka, Wrangel Island, Somnitel'naya Bay, nival willow-mossy tundra in a depression at the slope base, 22.07.1985, O. Afonina (LE); Chukotka Peninsula, Lavrentiya Bay, Krause Cape, moss community on a rocky slope, 01.09.1975, O. Afonina (LE).

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