NEW RECORDS OF SCHISTIDIUM (GRIMMIACEAE, MUSCI) IN RUSSIA

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Abstract

Schistidium apocarpum subsp. canadense (Dupret) H.H.Blom ex B.H. Allen & Pursell, S. confusum H.H.Blom, S. scandicum H.H.Blom, S. sinensiapocarpum (Müll. Hal.) Ochyra and S. subflaccidum (Kindb.) H.H. Blom comb. nov. are reported for the moss flora of Russia for the first time. The name Grimmia subflaccida Kindb. is lectotypified. For three of these species not included in recent publications the brief descriptions and illustrations are provided. Eleven species and two subspecies are reported as new for different regions of Russia.

The species concepts in Schistidium were strongly reconsidered by Blom (1996, 1998), who studied mostly north European collections. In the course of subsequent studies of the bryophyte flora of Russia, new data on Schistidium species were accumulated. Some of them were published in regional floras (e.g. Afonina, 2004; Ignatov & Ignatova, 2003, etc.), but the main amount remains unpublished.

During work on the updated check-list of mosses of the East Europe and North Asia (Ignatov, Afonina, Ignatova et al., 2006) we faced a problem of lack of references to these data. Thus we present the following list, that includes voucher specimens for regions from where species were not reported yet. Three species not included in previous publications of Blom (1996, 1998) are briefly described and illustrated.

Schistidium andreaeopsis (Müll.Hal.) Laz. – in Russia was known from Asian Arctic; newly recorded for European Arctic.

Province, Novaya Zemlya, Matochkin Schar, VIII.1891, Ekstam s.n. (S!).

Schistidium apocarpum subsp. canadense (Dupret) H.H.Blom ex B.H. Allen & Pursell – Fig. 1.

Plants medium-sized, in loose or dense tufts or mats, olivaceus-green or yellowish-green, sometimes ferrugineous. Stems (0.5-)1-2.5 cm, slightly irregularly branched, central strand absent. Leaves appressed when dry, erect-spread ing to widely spreading when moist, slightly falcato-secund, ovate-lanceolate to ovate-triangular, sharply keeled in upper part, acuminate, 2.0-3.0×0.6-0.8 mm; hyaline hair-point absent; margins recurved to shortly below leaf apex, bistratose in upper part, denticulate in upper part; costa strongly projecting dorsally, smooth, excurrent, forming stout, slightly denticulate, chlorophyloose mucro; lamina unistratose, in upper part often with bistratose strips; upper lamina cells irregular in shape, subquadrat e to transversely elon-
gate, 7-10×8-10 μm, thick-walled, not sinuose; median cells subquadrate to short rectangular, 8-12×7-8 μm, moderately sinuose; basal cells rectangular, 12-25×11-12 μm, thick-walled, not or slightly porose, basal marginal cells subquadrate to transversely rectangular. Perichaetial leaves oblong, 3-3.5×0.6-0.9 mm. Urn shortly and broadly oblong, 0.8-0.9×0.6-0.7 mm, length/width ratio ca. 1.2; exothecial cells predominantly subquadrate to transversely rectangular; peristome teeth

Fig. 1. *Schistidium apocarpum* (Hedw.) Bruch et al. subsp. *canadense* (Dupret) H.H.Blom ex B.H. Allen & Pursell (from: Primorskij Territory, Ussurijskij Reserve, Cherdantseva s.n., MW): 1-3 – habit, dry; 4 – capsule; 5 – peristome teeth; 6 – exothecial cells; 7 – upper lamina cells; 8 – cells of leaf apex; 9 – stem transverse section; 10 – mid-leaf lamina cells; 11-12 – stem leaves; 13, 15-17 – leaf transverse sections; 14 – basal leaf cells. Scale bars: 5 mm – for 1; 2 mm – for 2-4; 1 mm – for 11-12; 0.5 mm – for 15; 300 μm – for 5; 150 μm – for 13, 16-17; 100 μm – for 6-10, 14.
ca 500 μm, slightly or strongly perforated in upper part, patent to spreading, oblique, densely papillose. Spores ca. 15-17 μm.

Differentiation. The main characters differentiating *S. apocarpum* subsp. *canadense* from the type subspecies is the absence of hyaline hair-points and costa excurrent into a stout chlorophyllose mucro (hyaline hair-points of variable length usually present in *S. apocarpum* subsp. *apocarpum*, at least in uppermost leaves), and mostly shorter urn, with length/width ratio ca. 1.2 (vs. 1.2-2.0 in subsp. *apocarpum*).

New for Russia. This species, previously known from North America, was found in collections from many places in south-eastern part of Asian Russia: Tyva and Buryatia Republics, Chita and Amur Provinces, and Primorsky Territory. It is probably not rare in this area, especially in dry areas of Transbaikalia.

Selected specimens examined: Tyva Republic, Todzha depression, western end of Kadyshev Lake, northern shore, on rocks near the lake, 30.VIII.1999, Otnyukova s.n. (MW, ex. KRAS).

*Buryatia Republic*, NW shore of Baikal Lake, Kovrizhka Cape, on boulders at the lake shore, 27.VIII.1957, Bardunov s.n. (MW, ex. IRK).

*Irkutsk Province*, Baikal Lake, Aya Gulf, on boulders at lake shore, 29.VIII.1956, Bardunov s.n. (MW, ex IRK).

*Amurskaya Province*, NW shore of Lower Baikal, Kovrizhka Cape, on boulders at the lake shore, 27.VIII.1957, Bardunov s.n. (MW, ex. IRK).


*Schistidium boreale* Poelt – in Russia previously known from Karelia, Middle European Russia, Bashkortostan, South Siberia, Yakutia; newly recorded for *Chukotka Peninsula*: high-country Egyekinot-Iultin (30 km), pass on Iskaten Range (66°35'N – 179°10'W), 5.VIII.1967, Voronova s.n. (LE); vicinity Achchen Lake, valley of Granitnaya River (64°49'N – 174°55’W), calcareous rocks, 14.VIII.1970, Afonina s.n. (LE); vicinity of Yanrailenn settlement (64°53’N – 172°30’W), calcareous tundra, 20.VII.1976, Afonina s.n. (LE).

*Schistidium confusum* H.H.Blom – new for Russia, known by a single record: *Karelian Republic*, Pitkaranta District, about 4 km SE of Impilacht, above the mouth of river Sumerianjoki, Raukkianmaki, 5-50 m alt., Huttunen & Walberg # 759 (H).

*Schistidium dupretii* (Thér.) W.A.Weber – sporadically distributed species in the territory of Russia, known from Karelia, central European Russia, Urals, south Siberia, Yakutia, and Kamchatka; newly found in collection from south-east European Russia: *Volgograd Province*, Kamynchine District, Shcherbakovka Ravine, at the bottom, on rock, 2.V.2004, Suragina s.n. (MW).

*Schistidium elegantulum* H.H.Blom – not rare in Russian part of Caucasus, especially at the coast of The Black Sea, known from Altai Mts.; newly recorded for Russian Far East: *Primorskiy Territory*, Ussurijski Nature Reserve, Peishula, at the top of Zmeinaya Mt., Koryavaya Creek bank, Cherdantseva s.n. (VLA, MW).

*Schistidium frigidum* H.H.Blom – rather frequent in collections from the Asian Arctic, known from Karelia and Murmansk Province, Northern Ural Mts., and Kamchatka Peninsula; newly recorded from non-Arctic parts of Central Siberia and Yakutia, Middle Urals, Buryatia, and Khabarovsk Territory.

Selected specimens examined: Sverdlovskaya Province, Tylaijsko-Konzhakovsko-Serebryanskiy Mt. Ridge, Poludnevny Iov Creek upper course, on rock surface, Gorchakovskiy # 157 (MW).

*Schistidium lancifolium* (Kindb.) H.H.Blom – known in European part of Russia from several places in Karelia, Lipetzk Province, Caucasus and Bashkortostan, also reported from Primorsky Territory; newly recorded for southern Siberia: *Altai Republic*, Altajskiy State Reserve, Kamga River basin, Bolshoy Shaltan Creek, 530 m alt., on rocks near water, Ignatov # 866 (MHA).
**Schistidium platyphyllum** (Mitt.) Perss. subsp. abrupticotostatum (Bryhn) H.H.Blom (S. apocar-pum var. didymontoides Loeske & L.I.Savicz) – reported from northern Siberia (Blom, 1998); lectotype of S. apocar-pum var. didymontoides was collected at Vise Island (Severnaya Zemlya Islands). We found this subspecies in non-identified collections from Novaya Zemlya Islands: Northern Island, Russkaya Gavan Bay, rocky tundra at sea shore, L.I. Savicz #316 (LE).

**Schistidium pulchrum** H.H.Blom – a common species in Asian part of Russia, from the Arctic to southern Siberia and Russian Far East, known also from Karelia and the Middle and South Urals. Newly recorded for Polar Urals, and rather many localities revealed in Chukotka. Selected specimens examined: Kom Republic, Seida-Labynngi railway, «106 km» settlement, shisty rock outcrops near the bridge across Pajpuudyna River, 17.VIII.1964, Filin s.n. (MW).


**Schistidium robustum** (Nees & Hornsch.) H.H.Blom – was known in Russia only from Karelia, newly reported for the West Caucasus: Adygeya Republic, Belaya River Basin, Inzhenernyy Range, Zhelobnaya Creek, 720 m, rock hedge along a road, 5.VIII.1997, Akatova s.n. (MW).

**Schistidium scandicum** H.H.Blom – new for Russia, found in several localities in the Middle and South Urals.

Selected specimens examined: Perm Province, Lysvinskij District, right bank of Chusovaya River upstream Kyn-Zavod, Kamen Denezhnyy, limestone rock outcrops in the forest, on rocks, Bezgodov #66 (MW). Sverdlovsk Province, Alapaevskij District, Koptelovo railway station surroundings, left bank of Rezh River, on rock outcrops, Dyachenko #2128 (MW, ex SVER). Bashkortostan Republic, Burzyan District, 2 km S of Magadeevo, pine forest on S-facing slope, on rock, Ignatova #9/37 (MW).

**Schistidium sinensiapocarpum** (Müll.Hal.) Ochyra – Fig. 2. Plants medium-sized to large, in loose or dense tufts or mats, olivaceous-green or yellowish-green in upper part, sometimes ferrugineous, brownish below, often hoary. Stems 1.5–2.5 cm, slightly to strongly irregu- regularly branched, central strand weakly differentiated. Leaves straight, appressed when dry, erect-spreading when moist, ovate-lanceolate, sometimes with shoulders, sharply keeled in upper part, acuminate, 1.7–2.5×0.6–0.9 mm; hyaline hair-point 0.2–0.6 mm, straight, terete, slightly widened and flattened at base, not or slightly decurrent, coarsely and densely spinulose-denticulate, spinulae sharp and erect; margins recurved to shortly below leaf apex, bistratose in upper part or sometimes three- to four-stratose, smooth or rarely denticulate near apex; costa moderately to strongly projecting dorsally, papillose with low but wide, scattered papillae or occasionally almost smooth; lamina unistratose, in upper part mostly with bistratose strips, dorsally with few scattered low but wide papillae in upper part, ventrally smooth or with few papillae; upper lamina cells subquadrate and transversely shortly rect- angular to short rectangular, 8–10×7–10 μm, thick-walled, slightly sinuose; median cells subquad-
rate to short rectangular, 8-14×7-12 μm, strongly sinuose; basal cells rectangular, 17-30×11-12 μm, thick-walled, slightly porose, basal marginal cells subquadrate to transversely rectangular. Perichaetial leaves oblong, 3-3.5×0.7-0.9 mm, with longer hair-points, to 1.0-1.3 mm. Urn oblong-ovate, 1.1-1.3×0.6-0.7 mm, length/width ratio 1.6-1.8; exothecial cells predominantly subquadrate to transversely rectangular; peristome teeth 250-300 μm, subentire, patent to spreading, oblique, densely papillose. Spores ca. 9-12 μm.

**Differentiation.** The coarse, strongly spinulose hair-points usually make *Schistidium sinensiapocarpum* a conspicuous plant. Further, the often rusty or brownish tufts, occurrence of leaf cell papillae and relatively short peristome teeth add to its identification. *S. papillosum* has a much weaker, usually flexuose hair-point, and possess-
es longer peristome teeth (330-500 vs. 250-300 μm in S. sinensiapocarpum).

The hair-point structure of S. robustum may be similar to that of S. sinensiapocarpum, although possessing much shorter spinulae. S. robustum has smooth leaves, and lacks the rusty-red coloration often seen in S. sinensiapocarpum.

In Russia S. sinensiapocarpum often grows in xeric habitats, but many collections were made on rocks along streams in generally xeric areas. The species grows on calcareous rocks.

New for Russia, found in the Caucasus and more southern regions of Siberia.


Plants small, in dense cushions which easily fall apart, green or olivaceus-green in upper part, brownish below. Stems 10-20 mm, occasionally strongly branching, with well differentiated narrow central strand. Leaves ovate-lanceolate, sharply keeled in upper part, acute, 1.2-1.5×0.5-0.6 mm, hyaline hair-point 0.1-0.5 mm, terete, slightly widened at base, not decurrent, coarsely spinulose, spinulae long; margins plane at base, recurved to shortly below leaf apex, partially bistratose in upper part, smooth; costa slightly projecting dorsally, smooth; lamina unistratose, occasionally with bistratose strips; upper lamina cells round-oval, 7-8 μm, thick-walled, not sinuose; median cells subquadrate to short rectangular, 7-14×8 μm; basal cells rectangular, 15-50×8-11(-13) μm, basal marginal cells with slightly thickened transverse walls, subhyaline in 1-2 rows. Perichaetal leaves oblong, 2.25×0.7-1.0 mm, hyaline hair-point to 0.8 mm. Urn oblong-cylindrical, 1.3-1.5×0.6 mm, length/width ratio 1.5-1.6; exothecial cells predominantly rectangular; peristome teeth 220-230 μm, entire, recurved when old, densely papillose, papilae low. Spores ca. 12-14 μm.

Differentiation. Schistidium subflaccidum resembles S. confertum (Funck) Bruch et al. in small size of plants and sharply and strongly denticulate hair-point, but hair-point structure (terete vs. weak and flattened in S. confertum), peristome teeth (subentire vs. strongly perforated) and urn shape (oblong-cylindrical, with length/width ratio 1.5-1.6 vs. ovoid to shortly oblong, with length/width ratio 0.9-1.7) clearly differentiate these species.

Schistidium scandicum is somewhat similar to S. subflaccidum in habit and sporophyte characters, but is readily distinguished from S. subflaccidum by its finely denticulate and distinctly flattened hair-points.

The recently described S. spinosum H.H. Blom & Lüth has a hair-point structure similar to that of S. subflaccidum. This species, however, possesses an obovoid urn (length/width ratio 0.9-1.3) clearly different from the oblong-cylindrical urn in S. subflaccidum (length/width ratio 1.5-1.6).

New for Russia, known by a single record from Caucasus. Karachaevo-Cherkessian Republic, Teberda State Reserve, right slope of Uullu-Murudzhu River, 2100 m alt., birch forest in flood valley, on rock, Ignatov & Ignatova #05-3973 (MW).

Schistidium submuticum Broth. ex H.H. Blom subsp. submuticum – common in European part of Russia and Urals, mostly on calcareous rocks, reported also from Siberian Arctic and Yakutia.
Newly found in a collection from Transbaikalia: Republic Buryatia, NE Baikal, Svyatoj Nos cape, cliffs at the lake shore, on rock surface, 26.VI.1956, Bardunov s.n. (MW, ex IRK).

**Schistidium submuticum** subsp. **arcticum** H.H.Blom – known from Yakutia (Blom, 1996), newly recorded for Chukotka.

Selected specimens examined: **Chukotskiy Autonomous District**: Wrangel Island, bird colony on the seashore (71°10’N – 178°50’E), 24.VIII.1985, Afonina s.n. (LE); north-east part of north seashore of Senyavin strait, near Yanrakynnot village, on rocks (64°53’N – 172°30’W), 24.VIII.1985, Afonina s.n. (LE); lower course of Chegitun River, right stony slope of river, (66°30’N – 171°05’W), 9.VIII. 1991, Afonina s.n. (LE).

**Schistidium trichodon** (Brid.) Poelt var. **nuttans** H.H.Blom – all the records of this species from Russia are represented by var. nuttans. It was reported previously from Caucasus, Altai Mts. and Kamchatka (Blom, 1996). Newly recorded from southern part of Russian Far East.


**Schistidium venetum** H.H.Blom – in Russia previously known from Murmansk Province (Blom, 1996); newly recorded from **Chukotskiy Autonomous District**: Anadyr district, east-facing slope of Pekulnei Range, upper course of Televeem River (65°50’N – 175°05’W), on rocks, 24.VII.1979, Afonina s.n. (LE).

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