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**PARMELIA ASIATICA (PARMELIACEAE): THE FIRST
RECORD FOR THE LICHEN FLORA OF RUSSIA**

**PARMELIA ASIATICA (PARMELIACEAE) — НОВЫЙ ВИД
ДЛЯ ЛИХЕНОФЛОРЫ РОССИИ**

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Recently described from China *Parmelia asiatica* A. Crespo et Divakar is recorded for the first time in Russia from Kamchatka Peninsula (Eastern Volcanic Range) and Baikal Siberia (Baikalsky, Delun-Uransky and Kodar Ranges). Updated description and localities of the species are presented.

Keywords: new records, *Parmelia asiatica*, Kamchatka Peninsula, Baikal Siberia.

Недавно описанный из Китая лишайник *Parmelia asiatica* A. Crespo et Divakar впервые обнаружен на территории России на Камчатке (Восточный Вулканический хребет) и в Байкальской Сибири (хребты Байкальский, Делюн-Уранский и Кодар). Приведены дополненное описание вида и сведения о его местонахождениях.

Ключевые слова: новые находки, *Parmelia asiatica*, полуостров Камчатка, Байкальская Сибирь.

During the revision of lichen collections from different parts of Kamchatka and Baikal Siberia we have found several specimens of *Parmelia asiatica* A. Crespo et Divakar which was recently described from China (southern Yunnan Province, Jianchuan County) and so far known from the type locality only (Lumbsch et al., 2011). We suppose that the species, reported here as new to Russia, might be rather common and widespread in Asiatic Russia, therefore its short description is presented here. It is based on the protologue and updated on the basis of the specimens collected in Russia. Secondary metabolites were analyzed and identified

by the second and third authors using standard HPTLC technique in C solvent system (Orange et al., 2001) in Laboratory of Lichenology and Bryology, Komarov Botanical Institute RAS. The mentioned specimens are kept in herbaria of the Irkutsk State University (IRKU), Komarov Botanical Institute (LE), St. Petersburg State University (LECB) and University of Helsinki (H).

Parmelia asiatica A. Crespo et Divakar, 2011, in Lumbsch et al., *Phytotaxa*, 18: 94.

Thallus foliose, small to medium size, 2–3 cm across, irregular, adnate to loosely adnate to substrate, with free lobes, anisotomically dichotomically branched when grows on thin branches. Lobes flat to slightly concave, narrow, 0.5–3.0 mm wide, sublinear, separate to contiguous, interstices acute. Upper surface grey to whitish grey, matt to shiny, sometimes slightly bluish pruinose towards the lobe ends, at first rather plane, smooth, sometimes slightly reticulate-foveolate, with fissures on older lobes, with soredia and pseudocyphellae, without isidia. Pseudocyphellae marginal on young lobes, linear to sublinear, appearing as a continuous white rim, later also laminal, becoming slightly reticulate. Soredia whitish to whitish green, granulose, in spherical or hemispherical terminal soralia, and also marginal, elevate to excavate. Lower surface uniformly black or dark brown towards the lobe ends in some specimens, moderately to densely rhizinate up to the lobe ends, rhizines squarrose or simple, 0.25–1.50 mm long. Representative photos of the species see in Lumbsch et al. (2011).

Lobes (130)190–210(240) μm thick, upper cortex paraplectenchymatous, light yellowish brown, (31)36–42(46) μm thick, lower cortex darker, brownish black, (24)28–33(35) μm thick. Algal layer 42–50 μm thick, containing *Trebouxia*. Medulla white, clearly separated, to 95 μm thick, composed of loosely interwoven hyphae 2.5–3.5 μm thick.

Apothecia not seen. Pycnidia extremely rare (three pycnidia are recorded in specimens from Baikal Siberia), laminal, immersed in the upper surface of lobes, up to 0.2 mm in diam., ostioles black, envelope to 2.5 μm thick. Conidia cylindrical, straight, bacilliform, (2.3)2.8–3.0(3.2) \times 0.6–0.8 μm .

Secondary metabolites (in six specimens tested by HPTLC): atranorin, salazinic and consalazinic acids; cortex K⁺ yellow, medulla K⁺ yellow turning red, C⁻, KC⁻, P⁺ orange-red.

P. asiatica differs from the morphologically close species *P. protosulcata* Hale which was recorded in the Southern Hemisphere (Hale, 1987; Kantvilas et al., 2002) by the presence of salazinic and consalazinic acids

and absence of protocetraric and lobaric acids. It differs from the chemically close widespread species *P. sulcata* Taylor by the narrow sublinear lobes with spherical or hemispherical terminal (also marginal) soralia. Molecular data based on nrITS rDNA confirm separation *P. asiatica* from *P. sulcata* (Lumbsch et al., 2011). Another sorediate taxon with salazinic and consalazinic acids, *P. cunninghamii* Cromb., is known from Australia, Tasmania, New Zealand and southern South America (Kantvilas et al., 2002). It is distinguished from *P. asiatica* by broadly rounded and clearly concave lobes with the marginal farinose soredia.

Selected specimens. Baikal Siberia: Irkutsk Region, Bodaybo District, Vitimsky State Reserve, Delun-Uransky Range, the Amalyk River valley, 57°11' N, 117°22' E, 472 m a. s. l., flood-plain birch forest with dwarf alder, horsetails and herbs, bark of the birch trunk, 13.07.1995, A. Lishtva (IRKU); Vitimsky State Reserve, Kodar Range, the Sygykta River valley near Oron Lake, 56°26' N, 117°07' E, 518 m a. s. l., birch forest with firs, mosses and herbs, bark of the birch trunk, 11.07.1996, A. Lishtva (IRKU), with pycnidia; Kazachinskoye District, Baikalsky Range, middle course of the Okunayka River, NE shore of Dal'nee Lake, 56°06' N, 108°17' E, 602 m a. s. l., fir-birch forest with mosses and herbs, bark of the birch trunk, 01.08.2012, A. Lishtva (IRKU), with pycnidia; middle course of the Okunayka River, 56°03' N, 108°23' E, 607 m a. s. l., Siberian pine-fir forest with mosses and ferns, bark of the ash trunk, 06.08.2012, A. Lishtva (IRKU); valley of the Okunayka River near its inflow into Dal'nee Lake, 56°03'54.4" N, 108°23'49.3" E, 472 m a. s. l., fir-birch forest with ferns and tall herbs, bark of the birch trunk, 05.08.2012, A. Lishtva (LE), HPTLC. **Kamchatka Peninsula:** Central Kamchatka, Ust'-Kamchatsky District, the Elovka River basin, right bank of the Elovka River near the Levaya River inflow, 56°52'59.5" N, 160°55'06.3" E, 160 m a. s. l., spruce forest with birch, larch, rowan and mosses, bark of spruce and rowan trunks, 25.08.2003, D. Himelbrant, E. Kuznetsova (LE), HPTLC; Mil'kovsky District, Kronotsky State Reserve, Askhachny Range, the Levaya Schapina River basin, 55°08'10.6" N, 159°58'52.6" E, 320 m a. s. l., spruce-larch forest with birch and horsetails, bark of the birch trunk, 03.08.2009, D. Himelbrant, I. Stepanchikova (LE); 55°08'07.3" N, 159°57'22.5" E, 310 m a. s. l., spruce forest with larch, birch and mosses, bark of spruce branches, 11.08.2009, D. Himelbrant, I. Stepanchikova (H), HPTLC; 55°08'29.0" N, 159°58'16.7" E, 340 m a. s. l., spruce forest with larch, birch, rowan, dwarf pine and mosses, bark of spruce branches, 12.08.2009, D. Himelbrant, I. Stepanchikova (LE), HPTLC; 55°08'54.3" N, 159°59'38.0" E, 410 m a. s. l., spruce forest with birch, rowan, horsetails and mosses, bark of spruce branches, 11.08.2009, D. Himelbrant, I. Stepanchikova (H), HPTLC; 55°06'32.0" N, 160°00'46.0" E, 290 m a. s. l., spruce forest with larch, birch, rowan, dwarf pine and mosses, bark of spruce branches, 16.08.2009, D. Himelbrant, I. Stepanchikova (LECB), HPTLC; the Ipuin River basin, 55°06'05.2" N, 159°59'22.0" E, 280 m a. s. l., flood-plain poplar forest with spruce, larch, al-

der and herbs, bark of fallen spruce, 10.08.2009, D. Himelbrant, I. Stepanchikova (LECB).

Discussion. Russian material differs in some details from the protologue of *P. asiatica* (Lumbsch et al., 2011). The Siberian and Kamchatian specimens are characterized by linear marginal soralia in some specimens in addition to spherical or hemispherical terminal ones. Pseudocyphellae on younger lobes are marginal and linear to sublinear, but later become also laminal, sometimes slightly reticulate. Some old specimens have fissures on the upper surface of lobes. Moreover, few pycnidia were found in two specimens. All tested specimens from Baikal Siberia and Kamchatka Peninsula contain consalazinic acid in addition to salazinic acid and atranorin.

Revealed ecological preferences of Russian specimens of *P. asiatica* differ somewhat from *locus classicus* in China where the species grows in temperate region on *Rhododendron* sp. trunk in humid *Rhododendron*



Fig. World distribution of *Parmelia asiatica*.

forest at 2490 m a. s. l. (Lumbsch et al., 2011). Known Siberian and Kamchatian specimens were also collected in relatively humid spruce, fir and birch forests in valleys of mountain rivers, but on considerably lower elevation (160–607 m a. s. l.), and on bark of various trees (mainly spruce and birch) in boreal coniferous forests.

The present paper has significantly contributed to the knowledge on distribution of *P. asiatica*. Until this study, the species was known from the type locality (China, Yunnan: Jianchuan County, Shi Bao Shan Park, 26°22' N, 99°50' E) only. About 20 specimens have been additionally recorded from several localities close to the listed above. Cumulative data on the species distribution are presented in Fig. Based on the known distribution pattern and variations in ecology, we suppose that *P. asiatica* might be rather common and widespread in Asiatic Russia.

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