

New records of lichens and allied fungi from Koryakia (Northern Kamchatka, Russia)

Eseniya A. Timofeeva, Dmitry E. Himelbrant, Andrei Tsurykau^{1,2}, Irina S. Step-anchikova, Iryna Bolsun¹, Vadim E. Kirichenko, Konstantin I. Skvortsov, Valentina Yu. Neshataeva

¹ Francisk Skorina Gomel State University, Sovetskaja Str. 104, 246028, Gomel, Belarus

² Gomel State Medical University, Lange Str. 5, 246000, Gomel, Belarus

E-mail: eseniyat@list.ru

Abstract: Based on the collections of Koryak geobotanical expeditions of the Komarov Botanical Institute, 21 species of lichens and lichenicolous fungi are reported as new to Koryakia: 13 of them are also new to Kamchatka; *Arthonia granitophila*, *A. peltigerea*, and *Protoparmelia ochrococca* are new to the Russian Far East; *Fuscidea lowensis* and *Polycoccum microcarpum* are new to Russia. Altogether 550 species of lichens and allied fungi are currently known for Koryakia.

Keywords: Koryak State Reserve, Beringia, North Pacific, lichenized fungi.

INTRODUCTION

Koryakia (formerly Koryak Autonomous Okrug, now it is a part of Kamchatka Territory) occupies the northernmost part of the Kamchatka Peninsula and adjacent mainland area up to the borders of Magadan Region and Chukotka Autonomous Area (Fig. 1). Our study is focused on the northern (mainland) part of Koryakia.

Northern Koryakia is mostly mountainous area with the highest peak Ledyanaya Mt. (2453 m a. s. l.). In contrast to the most part of Kamchatka Peninsula, Northern Koryakia lacks active volcanoes. The vegetation of Northern Koryakia represents two different zones: eastern part of the area belongs to Beringian forest-tundra zone, and its western part belongs to East-Siberian larch forest subzone of the Eurasian boreal (taiga) zone. Three geobotanical provinces have been identified in the region, differing in composition and ratio of native formations, as well as in the type of altitudinal zonation of vegetation: the Koryak mountain province (dominated by pine elfin woodlands and shrubs), the Penzhina mountain-plain province (marshes, pine elfin woods and tundra) and the Kolyma province, covered mainly by larch forests and open woodlands. The geobotanical provinces have a submeridional extension, which is explained by the position of the mountain systems of the Koryak and Kolyma uplands, redistributing the air masses of the Bering and Okhotsk seas.

Altitudinal zonation of vegetation differs between the provinces and includes from two to three belts. The alpine vegetation belt (up to 400–450 m a. s. l. in eastern part, up to 700 m a. s. l. in western part) is characterized by a complex of dwarf-shrub and lichen tundra communities. The subalpine vegetation belt at lower elevations (up to 150–300 m a. s. l. in eastern part, up to 500 m a. s. l. in western part) includes Beringian creeping woodlands composed of *Pinus pumila* (Pallas) Regel and *Alnus fruticosa* Rupr. and thickets formed by *Betula divaricata* Ledeb. (= *B. middendorffii* Trautv. et Mey.). The third, lower mountain belt can be observed in some parts of Northern Koryakia. In the eastern part of the region, it is represented mainly by fragmentary *Betula ermanii* Cham. forests. In the western part (Penzhina River basin), *Larix cajanderi* Mayr open woodlands prevail. Azonal habitats such as wide river valleys are covered with floodplain forests (*Populus suaveolens* Fisch. ex Poit. & A. Vilm., *Salix arbutifolia* Pall., *S. udensis* Trautv. & C. A. Mey., and *S. schwerinii* E. L. Wolf; in western part also *Betula platyphylla* Sukacz) and thickets mostly composed of shrubby *Salix* spp. In azonal habitats also occur coastal dwarf-shrub tundras, salt marshes, mesic and hygic meadows, and isolated *Betula ermanii* groves. In lowlands and depressions, different types of mires and bogs develop (Neshataeva et al., 2020).

Koryakia represents a significant part of Beringian macroregion, and detailed knowledge of its biodiversity is important to make conclu-

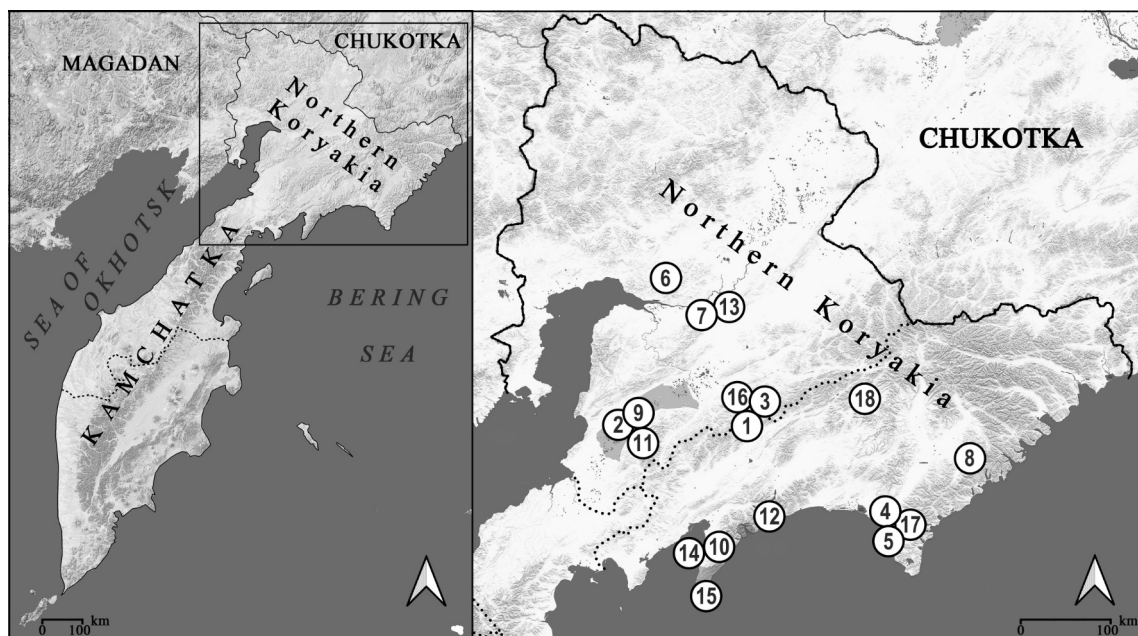


Fig. 1. Map of the study area. The collection localities are marked with numbers which correspond to those in the list of species.

sions on species distribution patterns, local peculiarities of biota, history of its formation, and endemism. However, until 2016 Koryakia was the last lichenologically unexplored part of Beringia. Since then, most of our knowledge on regional lichen biota came from the different parts of Koryak State Reserve (Himelbrant et al., 2019, 2021). Other investigations were carried out during annual phytosociological expeditions to the Northern Koryakia (Himelbrant et al., 2023). A total of 529 species of lichens and allied fungi were published for the region from those studies. The aim of this paper is to present the new records of lichens and lichenicolous fungi for Koryakia.

MATERIAL AND METHODS

The article is based on the specimens collected by V. E. Kirichenko in 2018–2023, K. I. Skvortsov and V. Yu. Neshataeva in 2022–2024, as well as D. E. Himelbrant and I. S. Stepanchikova in 2016–2018. All the collections were made in course of annual expeditions under the leadership of Valentina Yu. Neshataeva. The localities are shown on map (Fig. 1). The specimens are deposited in the lichen herbaria of the Komarov

Botanical Institute RAS (LE), St. Petersburg State University (LECB), and Francisk Skorina Gomel State University (GSU). The lichen specimens were identified by Eseniya A. Timofeeva, Dmitry E. Himelbrant, and Irina S. Stepanchikova using classical methods of microscopy. Andrei Tsurykau and Iryna Bolsun identified most of the lichenicolous fungi (see in the species list). Photos of the specimens (Fig. 2, 3) were taken by Eseniya A. Timofeeva and Irina S. Stepanchikova using stereoscopic microscope Zeiss Stemi 508 and transmitted light microscope Zeiss Axio Scope.A1 with an Axiocam 506 colour camera. High performance thin-layer chromatography (HPTLC) was performed according to standard techniques using solvent systems A and C (Orange et al., 2001).

The species list includes information on sampling locations, collection dates, names of collectors and distribution in the neighbouring regions (including Kamchatka Territory, Magadan Region, Chukotka Autonomous Area, and Alaska). The species new to the Russian Far East or Russia are accompanied by brief information on diagnostic characteristics and distribution. Lichen substances are given for HPTLC-analyzed species. The names of authors who collected

and/or identified material are abbreviated as follows: AT – Andrei Tsurykau, DH – Dmitry E. Himelbrant, IB – Iryna Bolsun, IS – Irina S. Stepanchikova, KS – Konstantin I. Skvortsov, VK – Vadim E. Kirichenko, VN – Valentina Yu. Neshataeva. Lichenicolous fungi are marked with #. All geographical coordinates are given in the spatial reference system WGS 84. The naming of taxa generally follows the most recent checklists of lichens in North America, Scandinavia, and Alaska (Esslinger, 2019; Westberg et al., 2021; Spribille et al., 2023) for lichens, as well as Diederich et al. (2018) and Zhurbenko (2025) for lichenicolous fungi.

RESULTS AND DISCUSSION

Altogether eight species of lichens and 13 lichenicolous fungi are reported as new to Koryakia. Of them, 13 species are also new to Kamchatka, *Arthonia granitophila*, *A. peltigerea*, and *Protoparmelia ochrococca* are new to the Russian Far East, whereas *Fuscidea lowensis* and *Polycoccum microcarpum* are new to Russia. Nowadays the revealed lichen biota of Koryakia counts 550 species, of which 500 are lichens, 41 are lichenicolous fungi, and 9 are allied saprobic fungi.

To date, the lichen diversity of Koryakia is far from completely studied. Due to remoteness and inaccessibility, two of the four Koryak districts, Karaginsky and Tigil'sky, remain completely unexplored. The other two districts, Olutorsky and Penzhinsky, have only been investigated in few locations. The list of lichenicolous fungi is also incomplete.

Further research is needed to reveal the lichen diversity of Koryakia and its position among other lichen biotas of the North Pacific region.

The species

ABROTHALLUS NEPHROMATIS Suija & Pérez-Ort.

Olutorsky District, Vyvenka River basin, Kailulovayam River valley, right bank, 61°16'09.0"N, 167°12'01.5"E, 130 m a. s. l. (Fig. 1, no. 1), *Betula platyphylla* forest, on thallus of *Nephroma parile* (Ach.) Ach. growing on the bark of *Betula platyphylla*, 25.07.2024, KS 2421 (LECB, det. ET & DH). New to Koryakia. Distribution in the

neighbouring regions: Kamchatka Territory (LE F-309945a).

ARTHONIA CLEMENS (Tul.) Th. Fr.

Penzhinsky District, Koryak Nature Reserve, Parapol'sky Dol segment, E to Talovskoe Lake, top of hill in hill range, 61°18'16.9"N, 164°45'55.0"E, 197 m a. s. l. (Fig. 1, no. 2), open rocky outcrops, on apothecia of *Rhizoplaca chrysoleuca* (Sm.) Zopf on siliceous rock, 10.08.2016, DH Tal-5 (GSU-2363, det. AT). New to Kamchatka Territory. Distribution in the neighbouring regions: Chukotka Autonomous Area (Zhurbenko, 2025) and Alaska (Spribille et al., 2023).

ARTHONIA GRANITOPHILA Th. Fr. (Fig. 2A, B)

Olutorsky District, Koryak Highlands, watershed of the Evyoinvayam and Nutovayam rivers, 61°28'56.4"N, 167°16'01.0"E (Fig. 1, no. 3), open rocky outcrops, on siliceous rock, 07.2021, VK 3-2021 (LE L-29328, det. ET, DH, & IS). New to the Russian Far East. The nearest known localities in Russia are in southern Siberia (Altai Republic, Republic of Tyva, Republic of Khakassia; Sedelnikova, 2013). The species is characterized by poorly developed thallus, usually rounded to elongate black apothecia with black-brown exciple and 1-septate spores becoming brownish and verrucose at late maturity (Frisch et al., 2014; Cannon, 2020). Our specimen has mostly curved apothecia.

ARTHONIA PELTIGEREA Th. Fr. (Fig. 2C)

Olutorsky District, basin of the Bystraya (Zelyonaya) River, western slope of the hill towards the lake, 60°22'03.0"N, 169°46'40.5"E, 60 m a. s. l. (Fig. 1, no. 4), coastal dwarf shrub *Empetrum* sp. tundra, on thallus of *Peltigera latiloba* Holt.-Hartw. growing on soil, 22.08.2023, KS & VN 2346 (LE L-29329, det. ET & DH). New to the Russian Far East. The nearest known locality in Russia is in Yakutia (Zhurbenko, 2025). *Arthonia peltigerea* is a lichenicolous fungus on thalli of *Peltigera* and *Solorina* species. It has black apothecia, immersed in the cortex of the host. The species is distinguished from similar *Arthonia fuscopurpurea* (Tul.) R. Sant., which is known from Yakutia, Krasnoyarsk Territory, and Alaska (Spribille et al., 2023; Zhurbenko, 2025), by its black apothecia without reddish

or purple tints, darker-coloured brown hypothecium and epithecium (both olive in KOH), and larger spores measuring $15\text{--}20 \times (5\text{--})6\text{--}7 \mu\text{m}$ (Cannon et al., 2020).

CATILLARIA STEREOCAULORUM (Th. Fr.) H. Olivier (Fig. 2E)

Olutorsky District, Olutorsky Peninsula, western spur of Kavacha Ridge in the vicinity of Kavacha Lagoon, southern slope of Mount Imlyavtina, $60^{\circ}14'57.9''\text{N}$, $170^{\circ}00'07.9''\text{E}$, 340 m a. s. l. (Fig. 1, no. 5), rocks along the edge of a cliff, on thallus of *Stereocaulon* cf. *alpinum* Laurer growing on soil, 24.08.2023, KS s. n. (LE L-29331, det. ET & DH). New to Kamchatka Territory. Distribution in the neighbouring regions: Chukotka Autonomous Area (Zhurbenko, 2025) and Alaska (Spribille et al., 2023).

CECIDONIA UMBONELLA (Nyl.) Triebel & Rambold (Fig. 2F)

Penzhinsky District, vicinity of Manily, Kamenny Ridge, top of mountain (843 m), $62^{\circ}36'46.7''\text{N}$, $165^{\circ}25'47.2''\text{E}$, 843 m a. s. l. (Fig. 1, no. 6), open rocky outcrops, on thallus of cf. *Lecidea* sp. growing on siliceous rock, 07.2018, VK 843 (LE L-29332, det. ET & DH). New to Kamchatka Territory. Distribution in the neighbouring regions: Chukotka Autonomous Area (Zhurbenko, 2025) and Alaska (Spribille et al., 2023).

FUSCIDEA LOWENSIS (H. Magn.) R. A. Anderson & Hertel (Fig. 2G)

Penzhinsky District, vicinity of Kamenskoe, between Kichavayam and Veykhavayam rivers, $62^{\circ}16'54.8''\text{N}$, $166^{\circ}07'05.1''\text{E}$ (Fig. 1, no. 7), open rocky outcrops, on siliceous rock, 08.2019, VK 3-2019 (LE L-29333, det. ET & DH). New to Russia and Beringia. The species is known from the northeastern part of North America (U. S. A., Canada; Fryday, 2008). It is characterized by convex areoles, apothecia with constricted base, negative spot tests, I+ violet, and UV+ white medulla (divaricatic acid; Fryday, 2008).

LENDEMERIELLA EXSECUTA (Nyl.) S. Y. Kondr. (Fig. 2D)

Olutorsky District, ca. 7 km southwest of the Anana Lake, watershed between the Ledyanoy Stream and Lada River, $60^{\circ}58'10.0''\text{N}$, $171^{\circ}17'52.1''\text{E}$, 432 m a. s. l. (Fig. 1, no. 8), open

rocky outcrops, on siliceous rock, 01.08.2023, VK s. n. (LE L-29330, det. ET, DH, & Ivan V. Frolov). New to Koryakia. Distribution in the neighbouring regions: Kamchatka Territory (Commander Islands; Frolov et al., 2025) and Alaska (Spribille et al., 2023).

LICHENOCONIUM LECANORAE (Jaap) D. Hawksw.

Penzhinsky District, Koryak Nature Reserve, Parapol'sky Dol segment, E to Talovskoe Lake, top of a hill in hill range, $61^{\circ}18'16.9''\text{N}$, $164^{\circ}45'55.0''\text{E}$, 197 m a. s. l. (Fig. 1, no. 2), open rocky outcrops, on thallus of *Rhizoplaca chryssoleuca* growing on siliceous rock, 10.08.2016, DH Tal-5 (GSU-2363, det. AT); *ibid.*, northeast of Talovskoe Lake, top of a hill in hill range, $61^{\circ}21'03.7''\text{N}$, $164^{\circ}50'33.0''\text{E}$, 223 m a. s. l. (Fig. 1, no. 9), open rocky outcrops, on thallus of *Ramalina scoparia* Vain. growing on siliceous rock, 12.08.2016, DH Tal-a3 (GSU-2364, det. AT). New to Koryakia. Distribution in the neighbouring regions: Kamchatka Territory (Zhurbenko et al., 2012), Chukotka Autonomous Area (Zhurbenko, 2025), and Alaska (Spribille et al., 2023).

POLYCOCCUM MICROCARPUM Diederich & Etayo (Fig. 3A, B)

Olutorsky District, Goven Peninsula, 5 km NEE of cape Peschany, spurs of the Malinovskogo Ridge, near Rogataya Mt., $60^{\circ}07'47.8''\text{N}$, $166^{\circ}21'09.4''\text{E}$, 102 m a. s. l. (Fig. 1, no. 10), mountain tundra with lichens and dwarf shrubs, on thallus of *Cladonia maxima* (Asahina) Ahti growing on soil, 21.07.2022, KS 2218 (GSU-2365, det. IB & AT); Penzhinsky District, gold mine "Ametistovoe", near the quarries, $61^{\circ}19'06.8''\text{N}$, $164^{\circ}52'33.3''\text{E}$, 149 m a. s. l. (Fig. 1, no. 11), dwarf shrub-moss-lichen tundra, on thallus of *Cladonia gracilis* (L.) Willd. subsp. *vulnerata* Ahti growing on soil, 25.08.2022, KS 2251 (GSU-2366, det. IB). New to Russia. Distribution in the neighbouring regions: Alaska (Spribille et al., 2023). *Polycoccum microcarpum* seems to be quite a variable species. In the protologue, it was described as causing galls on host squamules and having ascumata $30\text{--}60\text{--}100 \mu\text{m}$ in diameter, asci $30\text{--}35 \times 15 \mu\text{m}$, and smooth ascospores measuring $12.0\text{--}14.5 \times 4.5\text{--}7.0 \mu\text{m}$ (Etayo & Diederich, 1998). Flakus et al. (2008) reported that their specimens had larger ascumata up to $100\text{--}120 \mu\text{m}$, longer asci (up

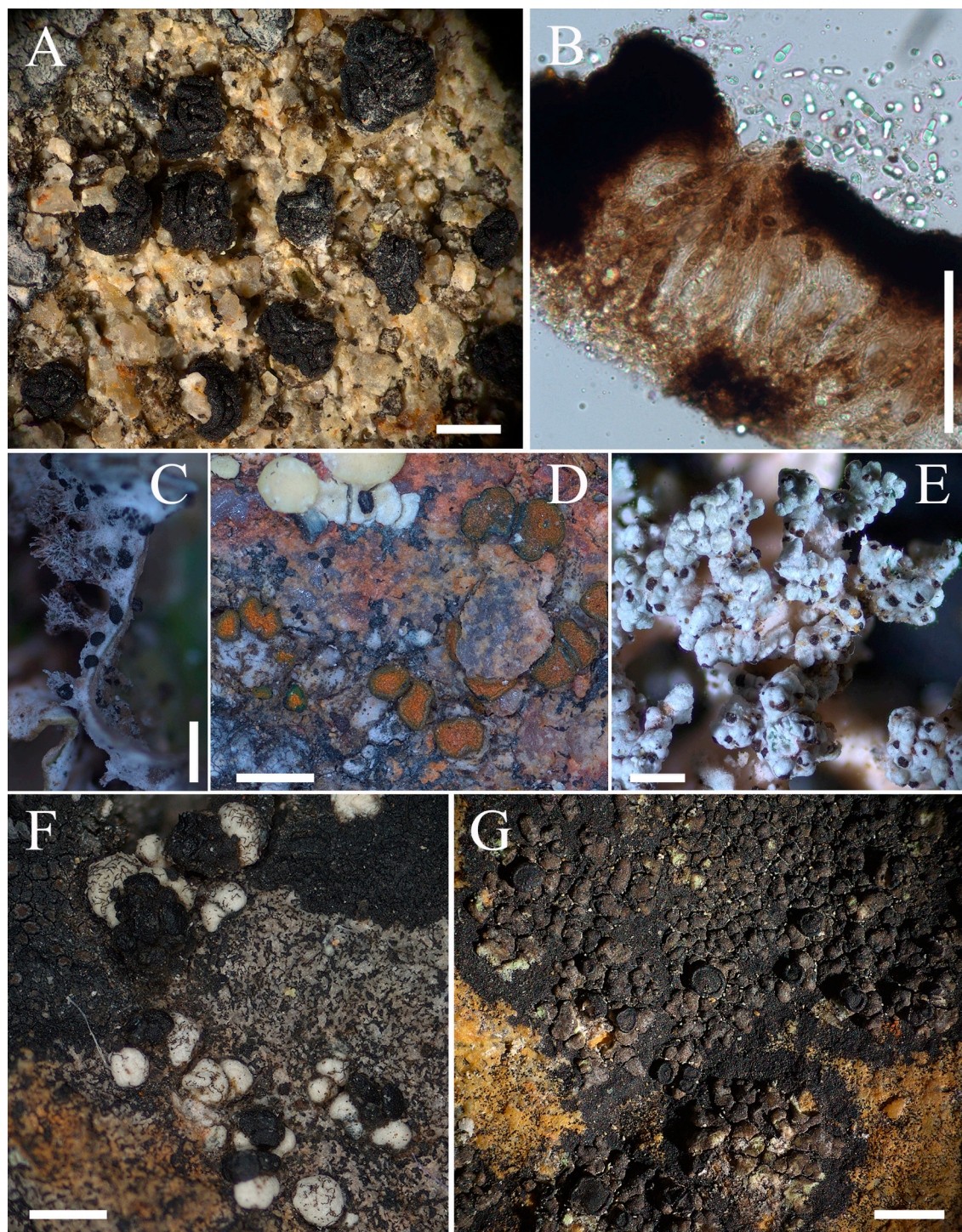


Fig. 2. A, B – *Arthonia granitophila*: A – thallus with apothecia; B – cross section of apothecium; C – *Arthonia peltigerea*; D – *Lendemeriella exsecuta*; E – *Catillaria stereocaulorum*; F – *Cecidonia umbonella*; G – *Fuscidea lowensis*. Scale bars: A, C, D, E, F = 0.5 mm; B = 100 μ m; G = 2 mm.

to $55 \times 15 \mu\text{m}$) and some minutely verruculose ascospores reaching $17 \mu\text{m}$ in length. Zhurbenko & Pino-Bodas (2017) also reported larger ascospores mainly $50\text{--}70 \mu\text{m}$ in diameter, longer asci $40\text{--}50 \times 12\text{--}14 \mu\text{m}$ and verruculose ascospores $(11.8\text{--})12.9\text{--}14.9(17.0) \times (4.5\text{--})5.0\text{--}6.2(7.4) \mu\text{m}$ in size.

In our material perithecia measuring $(20\text{--})40\text{--}60(100) \mu\text{m}$ in diameter are immersed in bleaching parts of the podetia, more rarely in convex galls. Asci are 8-spored, $41.0\text{--}44.0 \times 12.5\text{--}13.5 \mu\text{m}$ ($n=5$). Ascospores are brown, 1-septate, slightly constricted at the septum, with unequal cells, smooth, $(13.5\text{--})14.2\text{--}16.0(17.0) \times (5.0\text{--})5.2\text{--}6.2(7.0)$ ($n=30$).

PROTOPARMELIA OCHROCOCCA (Nyl.) P. M. Jørg. (Fig. 3G)

Olutorsky District, Gulf Olutorsky, Srednyaya Bay, southwest coast, eastern slope of the coastal ridge, $60^{\circ}25'15.7''\text{N}$, $167^{\circ}19'22.4''\text{E}$ (Fig. 1, no. 12), stone birch forest on overgrown scree, on bark of *Betula ermanii*, 26.07.2019, VK 1929 (LE L-29335, det. ET & DH). New to the Russian Far East. Distribution in the neighbouring regions: Alaska (Spribille et al., 2023). The nearest locality in Russia is in Yamal-Nenets Autonomous Area (Zhdanov, 2017). The species grows on bark and wood. It has a glossy chestnut brown thallus consisting of spherical areoles or granules. Apothecia are common, glossy, and usually become convex (Zhdanov, 2017).

PSEUDOSAGEDIA CHLOROTICA (Ach.) Hafellner et Kalb

Penzhinsky District, ca. 70 km to Kamenskoe, Belaya River, $62^{\circ}21'15.2''\text{N}$, $166^{\circ}32'46.7''\text{E}$ (Fig. 1, no. 13), open rocky outcrops (butte), on siliceous rock, 14.07.2018, VK s. n. (LE L-29334, det. ET & IS). New to Koryakia. Distribution in the neighboring regions: Kamchatka Territory (Neshataeva et al., 2003), Chukotka Autonomous Area (Andreev et al., 1996), and Alaska (Spribille et al., 2023).

RHIZOCARPON ALPICOLA (Fr.) Rabenh.

Penzhinsky District, vicinity of Manily, Kamenny Ridge, top of mountain (843 m), $62^{\circ}36'46.7''\text{N}$, $165^{\circ}25'47.2''\text{E}$ (Fig. 1, no. 6), open rocky outcrops, on siliceous rock, 07.2018, VK 843 (LE L-29344, det. ET & DH). New to Koryakia. Distribution in the neighbouring regions: Kam-

chatka Territory (Mikulin, 1987), Magadan Region (Kotlov, 1995), Chukotka Autonomous Area (Andreev, 1984), and Alaska (Spribille et al., 2023).

RHIZOCARPON COPELANDII (Körb.) Th. Fr.

Penzhinsky District, vicinity of Kamenskoe, between Kichavayam and Veykhavayam rivers, $62^{\circ}16'54.8''\text{N}$, $166^{\circ}07'05.1''\text{E}$ (Fig. 1, no. 7), open rocky outcrops, on siliceous rock, 08.2019, VK 3-2019 (LE L-29346, det. ET & DH). New to Koryakia. Distribution in the neighbouring regions: Kamchatka Territory (Himmelbrant et al., 2014), Magadan Region (Kotlov, 1995), Chukotka Autonomous Area (Makarova & Katenin, 2009), and Alaska (Spribille et al., 2023).

RHIZOCARPON PARVUM Runemark (Fig. 3H)

Penzhinsky District, vicinity of Kamenskoe, between Kichavayam and Veykhavayam rivers, $62^{\circ}16'54.8''\text{N}$, $166^{\circ}07'05.1''\text{E}$ (Fig. 1, no. 7), open rocky outcrops, associated with *Tremolecia atrata* (Ach.) Hertel, 08.2019, VK 3-2019 (LE L-29347, det. ET, DH & IS). New to Kamchatka Territory. Distribution in the neighbouring regions: Magadan Region (Zheludeva, 2023).

RHYMBOCARPUS NEGLECTUS (Vain.) Diederich & Etayo

Olutorsky District, conservation zone of Koryak State Reserve, southern part of Goven Peninsula, Cape Chayachy (Paryn), $60^{\circ}04'09.4''\text{N}$, $166^{\circ}10'58.9''\text{E}$, 19 m a. s. l. (Fig. 1, no. 14), seashore cliff and rocky outcrops nearby, on *Lepraria* sp. growing on mossy soil, 19.08.2018, DH & IS Chayachy-31-2018 (LECB, det. ET & IS). New to Koryakia. Distribution in the neighbouring regions: Kamchatka Territory (Commander Islands; Stepanchikova et al., 2023), Chukotka Autonomous Area (Zhurbenko, 2025), and Alaska (Spribille et al., 2023).

SAGEDIOPSIS CAMPSTERIANA (Linds.) D. Hawksw. & R. Sant.

Olutorsky District, Koryak State Reserve, segment "Mys Govená" (southern part of Goven Peninsula), west of the Yuzhnaya Hill, upper part of local ridge, $59^{\circ}48'44.9''\text{N}$, $166^{\circ}06'11.0''\text{E}$, 132 m a. s. l. (Fig. 1, no. 15), mosaic community on gravel: spots of lichen tundra, dwarf shrub tundra, and *Alnus fruticosa* Rupr. short (ca. 20–30

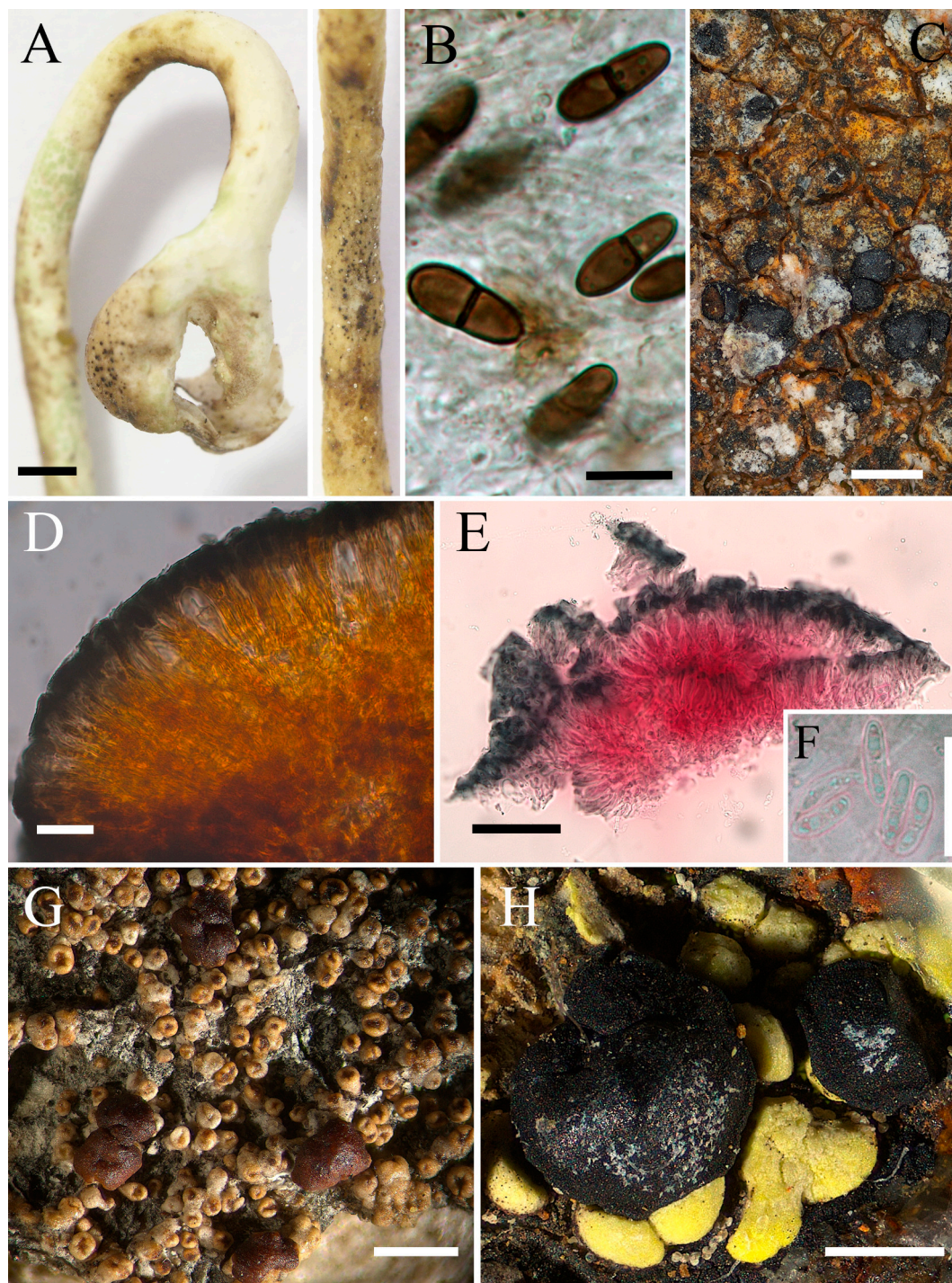


Fig. 3. A, B – *Polycoccum microcarpum*: A – pycnidia on galls (left) and bleaching parts of podetia (right); B – spores; C–F – *Scoliciosporum intrusum*: C – thallus with apothecia; D – cross section of apothecium; E – cross section of apothecium in KOH; F – spores; G – *Protoparmelia ochrococca*; H – *Rhizocarpon parvum*. Scale bars: A = 1 mm; B = 10 μ m; C, G, H = 0.5 mm; D, F = 20 μ m; E = 50 μ m.

cm) shrubs with *Empetrum* sp. and *Betula exilis* Sukacz., on thallus of *Ochrolechia subplicans* (Nyl.) Brodo growing on rock, 11.08.2018, DH & IS Goven-6 (GSU-2367, det. AT). New to Kamchatka Territory. Distribution in the neighbouring regions: Chukotka Autonomous Area (Zhurbenko, 2025) and Alaska (Spribille et al., 2023).

SCOLICIOSPORUM INTRUSUM (Th. Fr.) Hafellner (Fig. 3C, D, E, F)

Penzhinsky District, Vetveisky Range, Evyoin-Enelkhan Pass between Nutovayam and Evyoinvayam rivers, 61°30'36.2"N, 167°12'51.2"E (Fig. 1, no. 16), open rocky outcrops, on thallus of *Porpidia* sp. growing on siliceous rock, 08.2021, VK 4-2021 (LE L-29348, det. ET & DH). New to Kamchatka Territory. Distribution in the neighbouring regions: Chukotka Autonomous Area (Zhurbenko, 2009) and Alaska (Spribille et al., 2023).

STIGMIDIUM STEREOCAULORUM Zhurb. & Triebel

Olutorsky District, Olutorsky Peninsula, watershed of the rivers Anichklanvayam and Yakhina, flat summit, 60°20'33.1"N, 170°02'38.0"E, 105 m a. s. l. (Fig. 1, no. 17), dwarf shrub-lichen mountain tundra, on thallus of *Stereocaulon saxatile* H. Magn. growing on rock, 04.08.2022, KS s. n. (GSU-2368, det. AT). New to Kamchatka Territory. Distribution in the neighbouring regions: Chukotka Autonomous Area (Zhurbenko, 2025).

THELOCARPON EPIBOLUM Nyl.

Olutorsky District, valley of the Pakhacha River in its upper reaches, left bank, floodplain terrace, 61°31'18.8"N, 169°09'49.9"E, 260 m a. s. l. (Fig. 1, no. 18), *Betula platyphylla* forest, on dead thallus of *Peltigera* cf. *aphthosa* (L.) Willd. on soil, 09.08.2024, KS & VN 2440 (LE L-29349, det. ET & DH). New to Koryakia. Distribution in the neighbouring regions: Kamchatka Territory (Himelbrant et al., 2014) and Alaska (Spribille et al., 2023).

ZYZYGOMYCES BACHMANNII (Diederich & M. S. Christ.) Diederich et al.

Penzhinsky District, gold mine "Ametistovoe", near the quarries, 61°19'06.8"N, 164°52'33.3"E, 149 m a. s. l. (Fig. 1, no. 11), dwarf shrub-moss-

lichen tundra, on thallus of *Cladonia gracilis* subsp. *vulnerata* growing on soil, 25.08.2022, KS 2251 (GSU-2369, det. IB). New to Kamchatka Territory. Distribution in the neighbouring regions: Chukotka Autonomous Area (Zhurbenko, 2025) and Alaska (Spribille et al., 2025).

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