



УДК 582.291:581.95(571.645)

Addition to the lichen flora of Kunashir Island (Sakhalin Region, Kuril Islands)

S. V. Chesnokov^{1, 2, 4*}, L. A. Konoreva^{1, 2, 3}

¹ Komarov Botanical Institute RAS, Prof. Popova St., 2, St. Petersburg, 197376, Russian Federation

² Botanical Garden-Institute FEB RAS, Makovskogo St., 142, Vladivostok, 690024, Russian Federation

³ Polar-Alpine Botanical Garden-Institute KSC RAS, Botanical Garden St., Kirovsk, Murmansk Region, 184256, Russian Federation
E-mail: ajdarzapov@yandex.ru; ORCID iD: <https://orcid.org/0000-0002-4487-5154>

⁴ E-mail: lukinbrat@mail.ru; ORCID iD: <https://orcid.org/0000-0001-9466-4534>

* Corresponding author

Keywords: *Agonimia pacifica*, Asia, distribution, new records, *Parmelia marmorophylla*, rare species, Russian Far East.

Summary. This study documents 36 new lichen species for Kunashir Island, thereby bringing the total number of known lichens and lichenicolous fungi on the island to 430. The species *Agonimia pacifica* and *Parmelia marmorophylla* are reported for Russia for the first time. *Cliostomum leprosum*, *Pseudosagedia borrieri*, *Thelocarpon superellum*, and *Trapelia corticola* are new to the Russian Far East. *Julella sericea*, *Micarea botryoides*, and *Muellerella lichenicola* are new to the Sakhalin Region. Six species are reported for the Kuril Islands for the first time. For each species, the nearest known locality is provided. For rare lichens, differences from closely related species are discussed. As a result of the revision, *Agonimia tristicula* and *Micarea xanthonica* were redefined and excluded from the Sakhalin Region checklist.

Дополнение к лишенофлоре о. Кунашир (Сахалинская область, Курильские острова)

С. В. Чесноков^{1, 2}, Л. А. Конорева^{1, 2, 3}

¹ Ботанический институт им. В. Л. Комарова РАН, ул. Проф. Попова, д. 2, г. Санкт-Петербург, 197376, Россия

² Ботанический сад-институт ДВО РАН, ул. Маковского, д. 142, г. Владивосток, 690024, Россия

³ Полярно-альпийский ботанический сад-институт Кольского научного центра РАН, ул. Ботанический сад, г. Кировск, Мурманская обл., 184256, Россия

Ключевые слова: Азия, Дальний Восток России, новые находки, распространение, редкие виды, *Agonimia pacifica*, *Parmelia marmorophylla*.

Аннотация. В этом исследовании впервые сообщается о 36 видах лишайников, новых для острова Кунашир. В результате общий список лишайников и лишенофильных грибов острова составляет 430 видов. *Agonimia pacifica* и *Parmelia marmorophylla* являются новыми видами для России. *Cliostomum leprosum*, *Pseudosagedia borrieri*, *Thelocarpon superellum* и *Trapelia corticola* впервые приводятся для Дальнего Востока России, *Julella sericea*, *Micarea botryoides* и *Muellerella lichenicola* – для Сахалинской области, 6 видов – для Курильских островов. Для каждого вида указано ближайшее известное местонахождение. Для редких лишайников обсуждаются отличия от близких видов. В результате ревизии *Agonimia tristicula* и *Micarea xanthonica* были переопределены и исключены из чек-листа Сахалинской области.

Introduction

Kunashir Island is the southernmost island of the Greater Kuril Islands, with an area of approximately 1490 km². The island extends roughly 123 km from northeast to southwest, and its width varies from 7 to 30 km. It is located between the islands of Iturup to the north and Hokkaido to the south. In the southeast of Kunashir Island lies the Little Kuril Ridge, separated from it by the South Kuril Strait. Administratively, Kunashir Island belongs to the South Kuril District of the Sakhalin Region.

The island was formed due to volcanic activity and consists of a chain of four active volcanoes: Tyatya, Golovnina, Ruruy, and Mendeleev, connected by low-lying isthmuses. The relief of Kunashir Island is mountainous, with absolute heights ranging from 2–5 m on the low-lying isthmuses, to 25–250 m on marine terraces, and up to 550–1800 m on the peaks of individual volcanoes and mountain ranges. The highest peak is Tyatya Volcano, which rises to 1819 m. The island is primarily composed of volcanic rocks (andesites and basalts), volcanic ash, and sedimentary deposits such as shale, sand, pebbles, and shell rock (Nevedomskaya, 1998).

The island has a temperate, humid maritime climate, strongly influenced by the surrounding waters of the Sea of Okhotsk and the Pacific Ocean, which contribute to the East Asian monsoons. The Okhotsk coast of Kunashir Island is warmed by the Kuroshio Current, while the Pacific coast is cooled by the cold Oyashio Current, resulting in warmer summers and winters on the Okhotsk coast compared to the Pacific coast (Atlas Kurilskikh..., 2009). Overall, the island is characterized by a prolonged cold spring, a damp and cool summer often marked by fog (especially along the Pacific coast), a long, relatively warm and dry autumn, and a fairly mild, snowy winter. Negative average monthly temperatures persist from December to April. In Yuzhno-Kurilsk, the average temperature in February is –5.6 °C, while in August it reaches +15.5 °C. The South Kuril region experiences a high annual precipitation rate, with Yuzhno-Kurilsk receiving an average of 1269 mm per year (Nauchno-prikladnoy..., 1990; Nevedomskaya, 1998).

Most of the rivers on Kunashir Island are mountain rivers characterized by their narrow riverbeds, steep slopes, and rapid flow. A large amount of rainfall creates a dense river network on the island, and the majority of these rivers rarely dry up. The lakes predominantly comprise lagoons, such as Peschanoe and Valentiny, and volcanic calderas, like Goryachee.

The boiling lake known as Ponto (or Kipyashchee) is located in the southern part of Kunashir Island. It is surrounded by numerous fumaroles along its shores and within its waters. Additionally, the numerous thermal springs of volcanic origin are presented on Kunashir Island.

Forests occupy up to 70 % of the total investigated area and are represented by mixed broadleaf and coniferous communities. The broadleaf forests primarily consist of *Quercus crispula* Blume and *Q. dentata* Thunb., *Acer ukurunduense* Trautv. et C. A. Mey. and *A. mayrii* Schwer., *Ulmus laciniata* (Trautv.) Mayr, *Kalopanax septemlobus* (Thunb.) Koidz., with a significant proportion of woody vines, such as *Actinidia arguta* (Siebold et Zucc.) Planch. ex Miq. and *A. kolomikta* (Maxim. et Rupr.) Maxim., *Schisandra chinensis* (Turcz.) Baill., *Toxicodendron orientale* Greene, *Hydrangea petiolaris* Siebold et Zucc. Coniferous forests are mainly composed of *Abies sachalinensis* (F. Schmidt) Mast., *Picea jezoensis* (Siebold et Zucc.) Carrière and *P. glehnii* (F. Schmidt) Mast. Alder-willow and willow forests predominate in river valleys and along lake shores. These forests are mainly dominated by *Alnus hirsuta* (Spach) Rupr. and various *Salix* species. The dense thickets of *Sasa kurilensis* (Rupr.) Makino et Shibata form under the canopy and within forest opening. The herbaceous communities with plants reaching heights of 1.5–2 m develop in river valleys and at the base of mountain slopes. The forests of *Betula ermanii* Cham. are prevalent at altitudes of 400–800 m. Up to approximately 1000 m, the vegetation is characterized by thickets of *Pinus pumila* (Pall.) Regel (Barkalov, Eremenko, 2003).

The history of lichen research on Kunashir Island dates back over 80 years. Prior to the Second World War, the island was part of Japan, and the earliest information on its lichens was obtained by Japanese researchers. The first data on Kunashir's lichen flora was provided by Satô (1936), who reported 11 species based on specimens collected in 1923 by Professor A. Yasuda. Kunashir Island became part of the USSR in 1945, after the Second World War. Thus, Russian researchers actively studied the island's lichen flora from the 1960s until the early 21st century. Most of the research during this period focused on various systematic groups of lichens (Trass, 1963, 1979; Rassadina, 1968; Oxner, Blum, 1971; Blum, Knyazheva, 1974; Randlane, Saag, 1992, 1998; Titov, Tibell, 1993; Tibell, Titov, 1995; Golubkova, 1994; Randlane et al., 1995; Dombrovskaya, 1996; Hafellner, 1997; McCune, Tchabanenko, 2001; etc.). However, only a few studies have provided

information on the overall diversity of the island's lichen flora (Insarov, Pchelkin, 1988; Bredkina et al., 1992; Tchabanenko, 1999).

Later, S. I. Tchabanenko compiled "The Synopsis of the lichen flora of the south of the Russian Far East", summarizing existing literature and supplementing it with her own data as well as herbarium information (Tchabanenko, 2002). This monograph listed 943 lichen species and 14 species of lichenicolous fungi for the southern Russian Far East, including approximately 260 species from Kunashir Island.

Currently, Kunashir Island remains a significant focus for researchers, and its materials are frequently utilized in systematic studies (Joneson et al., 2004; Tchabanenko, 2006; Titov, 2006; Ezhkin, Jørgensen, 2018; Gerasimova et al., 2018; Galanina, Ezhkin, 2019; Gagarina, Ezhkin, 2020; Popov et al., 2020; etc.) and floristic research (Bogacheva et al., 2018; Ezhkin, 2019, 2020a, 2022b; Konoreva et al., 2020; Davydov et al., 2021b; Ezhkin, Davydov, 2024; Ezhkin et al., 2025).

The lichen flora of Kunashir Island comprised 396 species before the present research. The aim of our study is to further investigate the diversity of lichens and allied fungi on Kunashir Island.

Materials and Methods

The specimens were collected on Kunashir Island in 2019. The material was examined by the authors in the Laboratory of Lichenology and Bryology at the Komarov Botanical Institute using standard microscopic techniques and a standard set of chemical reagents for color spot reactions (The Lichens..., 2009; Stepanchikova, Gagarina, 2014). Some specimens were studied using high-performance thin-layer chromatography in solvent system A and C (Orange et al., 2001). Photographs of the species were taken with a stereoscopic microscope Motic SMZ-171-LED with an attached MotiCam S6 camera and Axio Scope.A1 with an AxioCam 506 color camera. Geographical coordinates are given in the spatial reference system WGS 84. The nomenclature of lichens and lichenicolous fungi mainly follows Diederich et al. (2018), Kondratyuk et al. (2020) and Westberg et al. (2021).

The specimens are deposited in the lichen herbaria of the Komarov Botanical Institute of RAS (LE), Polar-Alpine Botanical Garden-Institute KSC RAS (KPABG) and Botanical Garden-Institute FEB RAS (VBGI). The duplicate specimens have been deposited in the herbaria of the Altai State University (ALTB).

Results and Discussion

For each species, a list of the studied specimens is provided, including the location, coordinates, community, substrate, collection date, collector's name, and herbarium number. The nearest localities are cited for each species. Special comments are included where necessary. The following symbols and abbreviations are used: "#" – lichenicolous fungi, "+" – non-lichenized fungi.

Species new to Russia

Agonimia pacifica (H. Harada) Diederich (Fig. 1): "Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Saratovskiy cordon, 44°15'41.4"N, 146°06'26.0"E, alt. 10 m, *Picea-Abies* forest with *Sasa kurilensis* by the seashore, on bark of *Abies sachalinensis*. 05 VI 2019. S. V. Chesnokov 37" (LE L-27520). – The species was originally described from Japan by Harada (1993) and placed in the genus *Agonimiella* H. Harada. Later, P. Diederich (Aptroot et al., 1997) demonstrated that the differences between the new genus and *Agonimia* Zahlbr. were less significant, and the species was transferred to the genus *Agonimia*. *Agonimia pacifica* has a pantropical distribution and reported from Japan (Harada, 1993), New Guinea (Aptroot et al., 1997), Reunion (van den Boom et al., 2011), Brazil (Aptroot, 2002a), Taiwan (Aptroot, 2003), Costa Rica (Aptroot et al., 2008), China (Kalb et al., 2012), Thailand (Aptroot et al., 2007), St. Helena and Ascension islands (Aptroot, 2008), South Korea (Kondratyuk et al., 2013), Kenya (Kirika et al., 2012), Sri Lanka (Weerakoon et al., 2016), Galapagos (Bungartz et al., 2013), Vietnam (Aptroot, Sparrius, 2006), New Zealand (de Lange et al., 2018), Mariana islands (Kerr, 2014), Seychelles (Diederich et al., 2017). The specimen corresponds to the protologue (Harada, 1993) and is characterized by a pale green squamulose thallus, tightly attached to the substratum, with ovoid or pyriform, smooth, gray to blackish perithecia. The asci are mostly monosporous, but asci with 2 to 4 spores also occur. The ascospores are muriform, $65\text{--}165.2 \times 25\text{--}35 \mu\text{m}$. A morphologically similar species is *Agonimia tristicula* (Nyl.) Zahlbr. However, it differs in the presence of thallus papillae (absent in *A. pacifica*), a lentiform subhymenium (concave in *A. pacifica*), two-layered perithecium wall (uniform in *A. pacifica*), and simple and short periphyses (longer, sparsely branched and anastomosing in *A. pacifica*). Additionally, *A. tristicula* has black and rough perithecia (grey and smooth in *A. pacifica*),

and its ascospores turn brown when mature (hyaline in *A. pacifica*).

Parmelia marmorophylla Kurok. (Fig. 2A): “Russia, Sakhalin Region, Kunashir Island, Kurilskiy

State Nature Reserve, neighborhood of the Kal’dernyi cordon, 43°51'31.3"N, 145°30'48.0"E, alt. 175 m, *Salix* sp. forest along creek with *Betula* sp., on bark of *Salix* sp. 10 VI 2019. L. A. Konoreva 141, S. V. Chesnokov

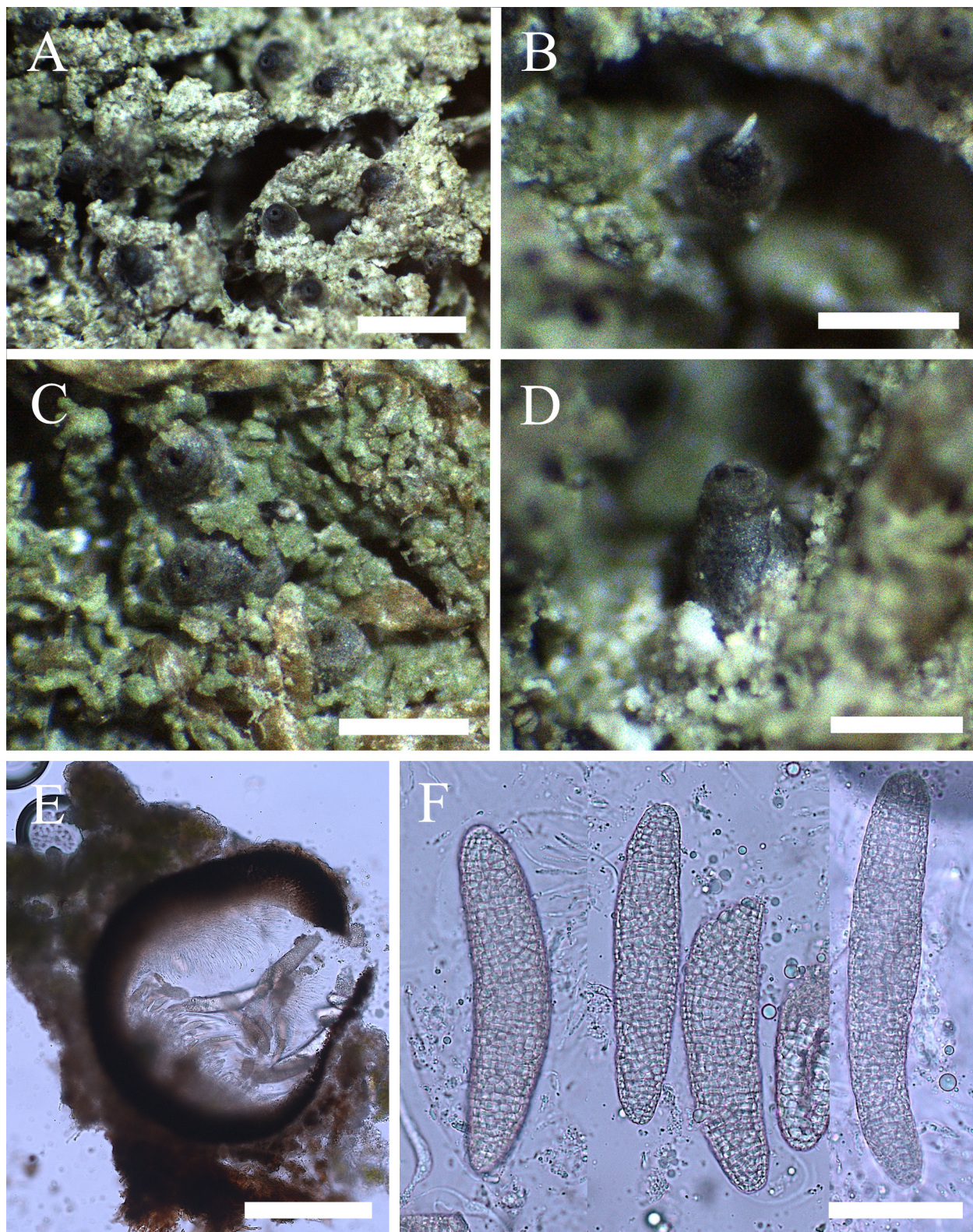


Fig. 1. *Agonimia pacifica* (LE L-27520): A and C – thallus with perithecia; B – large ascospore in the exit opening of the perithecium; D – pyriform perithecia with smooth wall; E – perithecium in section; F – hyaline muriform ascospores. Scale bar: A = 1 mm; B–D = 0.5 mm; E = 200 μ m; F = 50 μ m.

100", TLC: atranorin, chloratranorin, salazinic and consalazinic acids (ALTB, LE L-27496, 27602, VBG 171215). – The species is currently known only from Japan and is considered endemic (Kurokawa, 1994a). It is characterized by the absence of vegetative propagules, frequent apothecia, 8-spored asci (spores $12-14 \times 8-9 \mu\text{m}$), wide lobes (2–9 mm wide) with rounded apices, small and crowded pseudocyphellae, and simple or weakly branched rhizines. Morphologically, the species resembles corticolous *Parmelia* – *P. adaugescens* Nyl., *P. angustifolia* (Asahina) Kurok., *P. fertilis* Müll. Arg., *P. marmariza* Nyl., and *P. praesquarrosa* Kurok., which also have numerous apothecia and do not form vegetative propagules. However, *P. praesquarrosa* has squarose rhizines (Kurokawa, 1994b); *P. adaugescens* has large ascospores (more than $20 \mu\text{m}$); *P. angustifolia* and *P. fertilis* have short and rather sparse laminal pseudocyphellae; *P. marmariza* can be distinguished by the presence of fatty acids in the thallus and narrower lobes (1.5–3 mm wide) (Kurokawa, 1994a).

Species new to the Russian Far East

Cliostomum leprosum (Räsänen) Holien et Tønsberg: "Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Saratovskiy cordon, $44^{\circ}15'57.6''\text{N}$, $146^{\circ}07'16.3''\text{E}$, alt. 13 m, *Abies-Picea* forest on the seashore, on bark of *Picea* sp. 05 VI 2019. L. A. Konoreva 52" (KPABG 21407, VBG 141453). – The nearest locality is known in the Republic of Sakha (Yakutia) (Galanina, 2016). The species is characterized by a whitish, sorediate thallus, rare convex apothecia with a yellowish disc, 0.2–0.6 mm in diam., 1-septate spores, $8-16 \times 2.5-3.5 \mu\text{m}$ and numerous black pycnidia, 0.2–0.5 mm in diameter. Morphologically, *Cliostomum leprosum* is very similar to *C. flavidulum* Hafellner et Kalb. However, *C. flavidulum* is distinguished by its colorless pycnidia and the presence of fumarprotocetraric acid in the thallus (Pd+ red), whereas *C. leprosum* has black pycnidia and a thallus containing caperatic acid (Pd–) (The Lichens..., 2009). Chemically, *C. leprosum* is similar to *C. corrugatum* (Ach.) Fr., but the latter never produces soredia (The Lichens..., 2009).

Pseudosagedia borrieri (Trevis.) Hafellner et Kalb (Fig. 2B, D): "Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Rudnyi cordon, right bank of Severyanka River, $44^{\circ}20'20.9''\text{N}$, $146^{\circ}00'44.3''\text{E}$, alt. 12 m, *Ulmus-Acer*-tall grass community, on bark of *Alnus* sp. 07 VI 2019. L. A. Konoreva 72" (LE L-27617). – The nearest localities are known in the Leningrad

Region (Kuznetsova et al., 2007), Karelia (Kotkova et al., 2023), and Adygea (Urbanavichus et al., 2017) Republics. This species is characterized by a well-developed, grey-brown to green-brown or blackish olive, continuous to cracked thallus, prominent black perithecia, 0.3–0.5 mm in diam., with purple-violet to purple-brown involucrellum containing photobiont cells and 5–7-septate ascospores $25-40 \times 4-5 \mu\text{m}$. The closely related *P. aenea* (Körb.) Hafellner et Kalb has smaller perithecia 0.12–0.3 mm in diam., and 3 septate ascospores (The Lichens..., 2009).

Thelocarpon superellum Nyl.: "Russia, Sakhalin Region, Kunashir Island, neighborhood of the Mendelev volcano, $44^{\circ}00'03.9''\text{N}$, $145^{\circ}42'26.0''\text{E}$, alt. 157 m, *Betula-Abies* forest, on stone. 12 VI 2019. S. V. Chesnokov 114" (ALTB, LE L-27495). – The nearest localities are known in the Kemerovo Region, Krasnoyarsk Territory, Republics of Altai, Tyva, Khakassia (Sedelnikova, 2013). The species is characterized by yellow-pruinose conical or globose perithecia 0.2–0.3 mm in diam., simple paraphyses, and multispore asci with simple spores (The Lichens..., 2009).

Trapelia corticola Coppins et P. James (Fig. 2C): "Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, right bank of Mostovaya River, $44^{\circ}12'49.3''\text{N}$, $146^{\circ}01'41.1''\text{E}$, alt. 67 m, *Betula-Picea-Abies* forest, on rotten wood of *Abies sachalinensis*. 06 VI 2019. S. V. Chesnokov 46"; TLC: gyrophoric acid (LE L-27545); "Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Rudnyi cordon, $44^{\circ}20'24.2''\text{N}$, $146^{\circ}00'15.3''\text{E}$, alt. 106 m, *Picea-Abies* forest, on bark of *Acer* sp. 06 VI 2019. L. A. Konoreva 64"; TLC: gyrophoric acid (ALTB, LE L-27612). – The nearest localities are known in the Leningrad (Himmelbrant et al., 2018) and Kostroma (Urbanavichene, Urbanavichus, 2019) Regions, and the Republic of Adygeya (Urbanavichus et al., 2020). The species is characterized by effuse, immersed, inconspicuous, dull green to green-brown areoles, and punctiform, rarely confluent, markedly convex structures, pale buff to pale green-buff in color, often erupting from a single areole soralia, and by the presence of gyrophoric acid. All studied specimens were sterile. Morphologically, it may resemble sterile samples of *Rinodina efflorescens* Malme, but *R. efflorescens* differs by the presence of pannarin (P+ orange, C–) (The Lichens..., 2009).

Species new to the Sakhalin Region

Julella sericea (A. Massal.) Coppins (Fig. 3): "Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of

the Rudnyi cordon, right bank of Severyanka River, 44°20'20.9"N, 146°00'44.3"E, alt. 12 m, *Ulmus-Acer*-tall grass community, on bark of *Phellodendron amurense*. 07 VI 2019. S. V. Chesnokov 58" (ALTB, LE L-27605, VBGI 171127). – The nearest locality is known in the Jewish Autonomous Region (Skirina, 2015). Rare species. It is non-lichenized saprophytic fungus, which is characterized by hemispherical, black, semi-immersed in the thallus perithecia with involucrellum and submuriform long ellipsoid to narrowly ovoid ascospores with gelatinous sheath (Aptroot, 2002b).

Micarea botryoides (Nyl.) Coppins: "Russia, Sakhalin Region, Kunashir Island, Kurilskiy State

Nature Reserve, neighborhood of the Saratovskiy cordon, left bank of Saratovskaya River, 44°16'21.7"N, 146°06'36.4"E, alt. 28 m, *Picea* forest with *Betula ermanii* and fern, on roots of *Picea* sp. 04 VI 2019. S. V. Chesnokov 18" (LE L-27522). – The nearest localities are known in the Khabarovsk Territory (Konoreva et al., 2021) and Magadan Region (Konoreva et al., 2024).

#*Muellerella lichenicola* (Sommerf.: Fr.) D. Hawksw.: "Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Rudnyi cordon, right bank of Severyanka River, 44°20'20.9"N, 146°00'44.3"E, alt. 12 m, *Ulmus-Acer*-tall grass community, on thallus and apothecia

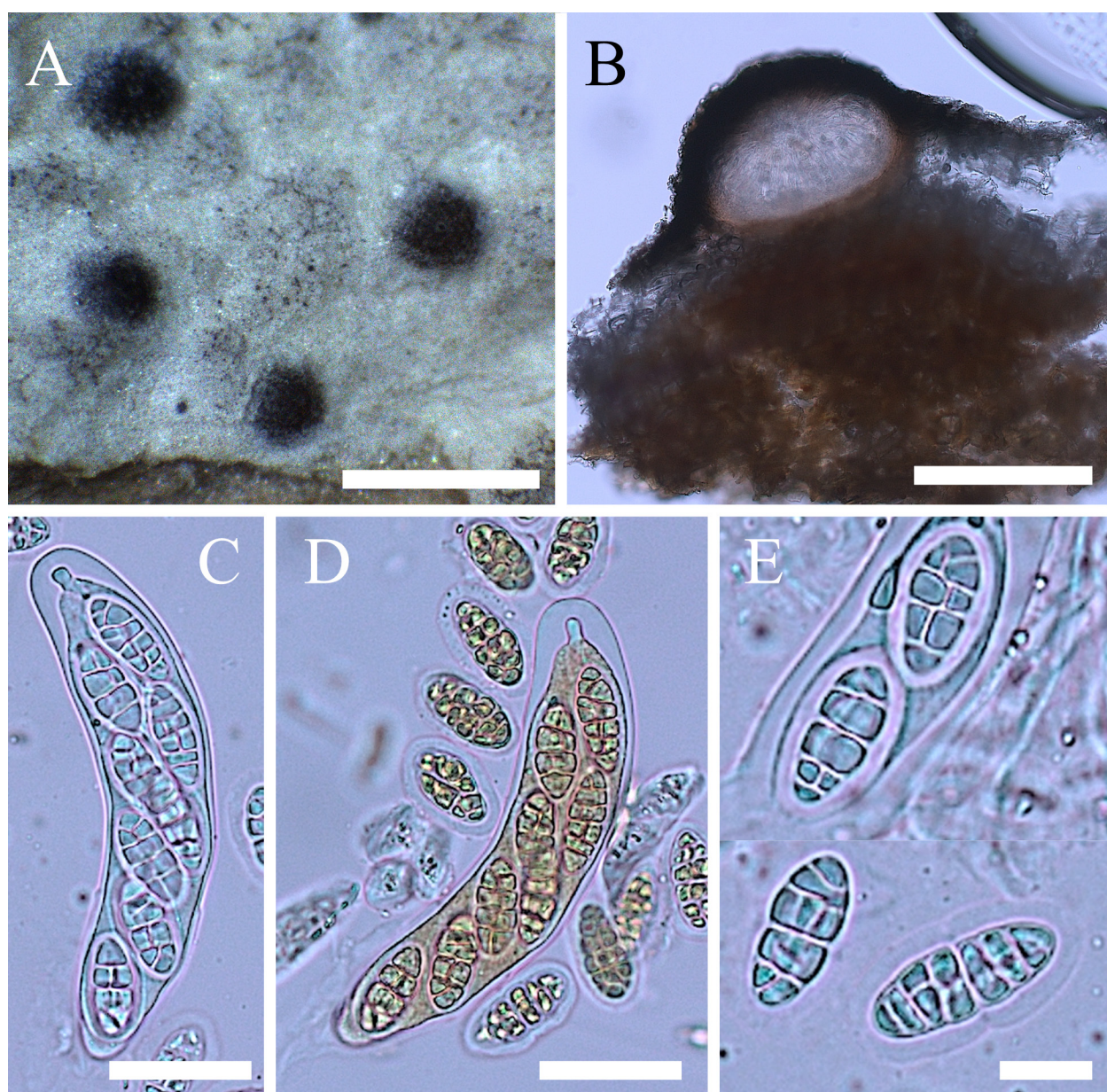


Fig. 2. *Julella sericea* (LE L-27605): A – perithecia; B – perithecia with involucrellum in section; C – ascus with ascospores in water; D – ascus with ascospores in I/KI; E – muriform ascospores with perisporium. Scale bar: A = 1 mm; B = 200 µm; C–D = 25 µm; E = 10 µm.

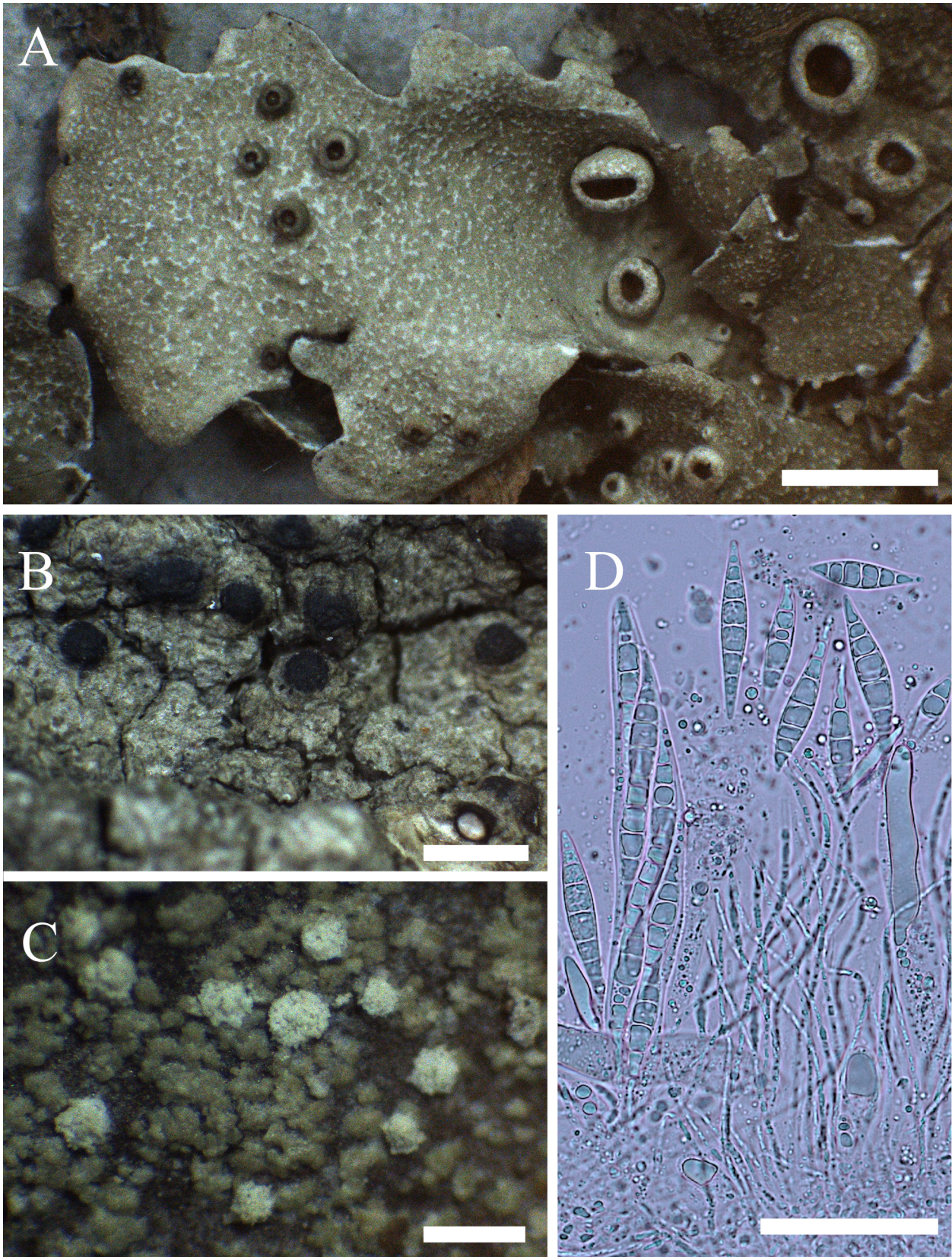


Fig. 3. New and rare species from Kunashir Island: A – *Parmelia marmorophylla* (LE L-27602); B – perithecia of *Pseudosagedia borrieri* (LE L 27617); C – thallus and soralia of *Trapelia corticola* (LE L-27612); D – ascus and ascospores *Pseudosagedia borrieri* (LE L-27617). Scale bar: A = 2 mm; B = 1 mm; C = 0.5 mm; D = 50 μ m.

of *Caloplaca gordejewii*. 07 VI 2019. L. A. Konoreva 70" (ALTB, LE L-27611). – The nearest locality is known in the Kamchatka Territory (Zhurbenko et al., 2012).

Species new to the Kuril Islands

Alyxoria culmigena (Libert) Ertz: "Russia, Sakhalin Region, Kunashir Island, neighborhood of the Mendelev volcano, 44°00'03.9"N, 145°42'26.0"E, alt. 157 m, *Betula ermanii*-*Abies sachalinensis* forest, on bark of *Abies sachalinensis*. 12 VI 2019. S. V. Chesnokov 111" (VBGI 141416). – Previously, the species was known in the Sakhalin Region only from Sakhalin Island (Konoreva et al., 2020).

Biatora pacifica Printzen et al.: "Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Rudnyi cordon, right bank of Severyanka River, 44°20'20.9"N, 146°00'44.3"E, alt. 12 m, *Ulmus-Acer*-tall grass community, on bark of *Acer* sp. 07 VI 2019. S. V. Chesnokov 57" (KPABG 21443, VBGI 171125); "Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Andreevskiy cordon, 43°51'06.7"N, 145°34'22.6"E, alt. 85 m, *Abies-Picea* forest near creek, on bark of *Picea* sp. 09 VI 2019. L. A. Konoreva 102" (VBGI 141464). "Russia, Sakhalin Region, Kunashir Island, neighborhood of the Mendelev volcano, 44°00'03.1"N, 145°42'38.4"E, alt. 208 m, *Abies*-mosses forest with *Picea* sp., on bark of *Picea* sp. and *Abies sachalinensis*. 12 VI 2019. S. V. Chesnokov 116, L. A. Konoreva 156" (VBGI 141420, 171222); "Russia, Sakhalin Region, Kunashir Island, neighborhood of Yuzhno-Kurilsk, 44°02'00.6"N, 145°49'19.8"E, alt. 11 m, *Abies-Picea* mixed herbs forest near creek, on bark of *Picea* sp. 13 VI 2019. L. A. Konoreva 168, 169" (VBGI 141480, KPABG 21439). – Previously, the species was known in the Sakhalin Region only from Sakhalin Island (Printzen et al., 2016). Rare species. The specimens are characterized by a relatively thick, warty, whitish thallus, numerous dark gray or olive-brown apothecia with a light proper margin that is flush with the disc, and the presence of Pontica-blue pigment in the hypothecia, as described by Printzen et al. (2016). The species may resemble some *Byssoloma* species due to the light margin, which contrasts with the darker disc.

Cladonia phyllophora Ehrh. ex Hoffm.: "Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Andreevskiy cordon, 43°51'06.7"N, 145°34'22.6"E, alt. 85 m, *Abies-Picea* forest near creek, on wood of *Abies sachalinensis*. 09 VI 2019. S. V. Chesnokov 72"

(VBGI 121894). – Previously, the species was known in the Sakhalin Region only from Sakhalin Island (Tchabanenko et al., 2018).

Lepra ophthalmiza (Nyl.) Hafellner: "Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Rudnyi cordon, 44°20'24.2"N, 146°00'15.3"E, alt. 106 m, *Picea-Abies* forest, on bark of *Acer* sp. 06 VI 2019. L. A. Konoreva 66"; TLC: 4 fatty acids (ALTB, LE L-28806). – Previously, the species was known in the Sakhalin Region only from Sakhalin Island (Tchabanenko, 2002; Skirina et al., 2021).

Mycobilimbia pilularis (Körb.) Hafellner et Türk: "Russia, Sakhalin Region, Kunashir Island, neighborhood of the Mendelev volcano, 43°59'24.5"N, 145°43'24.5"E, alt. 328 m, *Betula-Abies* forest on slope, on bark of *Sorbus* sp. and mosses. 12 VI 2019. S. V. Chesnokov 123" (LE L-27493). – Previously, the species was known in the Sakhalin Region only from Sakhalin Island (Tchabanenko, 2002).

+***Sarea difformis*** (Fr.) Fr.: "Russia, Sakhalin Region, Kunashir Island, Yuzhno-Kurilsk, the vicinity of Serebryanoe Lake, 44°03'24.2"N, 145°50'17.2"E, alt. 14 m, *Picea ajanensis* forest, on resin of *Picea ajanensis*. 03 VI 2019. S. V. Chesnokov 5" (KPABG 21442); "Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Saratovskiy cordon, left bank of Saratovskaya River, 44°16'21.7"N, 146°06'36.4"E, alt. 28 m, *Picea* forest with *Betula ermanii* and fern, on resin of *Picea* sp. 04 VI 2019. S. V. Chesnokov 16" (LE L-27536); "Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Andreevskiy cordon, 43°51'06.7"N, 145°34'22.6"E, alt. 85 m, *Abies-Picea* forest near creek, on resin of *Picea* sp. 09 VI 2019. L. A. Konoreva 102" (VBGI 171206). – Previously, the species was known in the Sakhalin Region only from Sakhalin Island (Konoreva et al., 2020).

Species new to Kunashir Island

Alectoria sarmentosa (Ach.) Ach. ssp. ***sarmentosa***: "Russia, Sakhalin Region, Kunashir Island, neighborhood of the Mendelev volcano, 44°00'03.1"N, 145°42'38.4"E, alt. 208 m, *Abies*-mosses forest with *Picea* sp., on bark of *Picea* sp. 12 VI 2019. L. A. Konoreva 157" (VBGI 171224); "Russia, Sakhalin Region, Kunashir Island, neighborhood of Yuzhno-Kurilsk, 44°02'00.6"N, 145°49'19.8"E, alt. 11 m, *Abies-Picea* mixed herbs forest near creek, on bark of *Picea* sp. 13 VI 2019. L. A. Konoreva 166, 168, 169" (VBGI 141481, 171231, 171232). – In the

Sakhalin Region, the species is known on the islands of Sakhalin (Skirina et al., 2021) and Shikotan (Chesnokov, Konoreva, 2022).

Arthonia ruana A. Massal.: "Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Andreevskiy cordon, 43°53'21.5"N, 145°37'12.1"E, alt. 28 m, *Quercus-Betula* tall grass forest, on bark of *Ulmus* sp. 09 VI 2019. S. V. Chesnokov 83" (LE L-27528). – Previously, the species was known in the Sakhalin Region only from Sakhalin Island (Ezhkin, Schumm, 2018; Ezhkin, 2020b; Skirina et al., 2021).

Arthonia vinosa Leight.: "Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Saratovskiy cordon, left bank of Saratovskaya River, 44°16'21.7"N, 146°06'36.4"E, alt. 28 m, *Picea* sp. forest with *Betula ermanii* and fern, on roots of *Picea* sp. 04 VI 2019. S. V. Chesnokov 18" (LE L-27523); "Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Andreevskiy cordon, 43°52'20.3"N, 145°35'27.4"E, alt. 89 m, *Abies sachalinensis* forest with *Sasa kurilensis* and *Betula ermanii*, on bark of *Betula ermanii*. 09 VI 2019. L. A. Konoreva 96" (VBGI 141460). – In the Sakhalin Region, the species is known on Shikotan Island (Chesnokov, Konoreva, 2022).

Biatora pontica Printzen et Tønsberg: "Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Andreevskiy cordon, left bank of Andreevka River, 43°53'18.6"N, 145°37'18.7"E, alt. 27 m, floodplain mixed forest, on bark of *Alnus* sp. 09 VI 2019. S. V. Chesnokov 78" (VBGI 141408); "Russia, Sakhalin Region, Kunashir Island, neighborhood of the Mendelev volcano, 44°00'03.1"N, 145°42'38.4"E, alt. 208 m, *Abies*-mosses forest with *Picea* sp., on bark of *Picea* sp. 12 VI 2019. S. V. Chesnokov 116" (VBGI 141419); "Russia, Sakhalin Region, Kunashir Island, neighborhood of Yuzhno-Kurilsk, 44°02'23.4"N, 145°48'12.3"E, alt. 23 m, *Alnus-Picea-Abies* mixed herbs forest, on bark of *Abies sachalinensis*. 13 VI 2019. L. A. Konoreva 172" (VBGI 171234). – In the Sakhalin Region, the species is known from Shikotan Island (Chesnokov, Konoreva, 2022). Rare species. The species is characterized by a light green, and occasionally dark or olive-green, thallus with punctate soralia that often coalesce to form a leprose surface, dark gray apothecia without a margin, and the presence of Pontica-blue and Pontica-red pigments in the hypothecium, and xanthonenes in the thallus (Printzen, Tønsberg, 2003). However, in our material, apothecia are rare and poorly visible, which

may identification more complicate. Nonetheless, the species can be easily distinguished from other sorediose *Biatora* species by its xanthonenes content, which produces a persistent orange reaction with C and a dull, dark orange glow under UV.

Bryobilimbia hypnorum (Lib.) Fryday et al.: "Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Rudnyi cordon, right bank of Severyanka River, 44°20'02.4"N, 146°01'09.3"E, alt. 17 m, *Alnus-Acer* floodplain forest, on mosses. 07 VI 2019. L. A. Konoreva 82" (VBGI 141459); "Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Andreevskiy cordon, 43°52'20.3"N, 145°35'27.4"E, alt. 89 m, *Abies sachalinensis* forest with *Sasa kurilensis* and *Betula ermanii*, on bark of *Acer* sp. 09 VI 2019. S. V. Chesnokov 67" (VBGI 121893). – In the Sakhalin Region, the species is known on the islands of Sakhalin (Ezhkin, Schumm, 2018; Tchabanenko et al., 2018) and Shikotan (Ezhkin, 2023).

Candelariella subdeflexa (Nyl.) Lettau: "Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Saratovskiy cordon, 44°15'41.4"N, 146°06'26.0"E, alt. 10 m, *Picea-Abies* forest with *Sasa kurilensis* by the seashore, on branches of *Abies sachalinensis*. 05 VI 2019. L. A. Konoreva 47" (VBGI 141450); "Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, caldera of Golovnin volcano, 43°51'34.4"N, 145°30'21.9"E, alt. 145 m, *Picea* forest near creek, on bark of *Sambucus* sp. 10 VI 2019. S. V. Chesnokov 89" (LE L-18011). – In the Sakhalin Region, the species is known on Shikotan Island (Chesnokov, Konoreva, 2022).

Cladonia ciliata Stirt.: "Russia, Sakhalin Region, Kunashir Island, neighborhood of Yuzhno-Kurilsk, 44°02'00.6"N, 145°49'19.8"E, alt. 11 m, *Abies-Picea* mixed herbs forest near creek, on soil. 13 VI 2019. L. A. Konoreva 165" (KPABG 21438, VBGI 171229). – In the Sakhalin Region, the species is known on the islands of Sakhalin (Tchabanenko, 2002; Skirina et al., 2021) and Paramushir (Zueva et al., 2024).

Cresponea chloroconia (Tuck.) Egea et Torrente: "Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Andreevskiy cordon, 43°52'20.3"N, 145°35'27.4"E, alt. 89 m, *Abies sachalinensis* forest with *Sasa kurilensis* and *Betula ermanii*, on bark of *Betula ermanii*. 09 VI 2019. L. A. Konoreva 96" (VBGI 171205). – In the Sakhalin Region, the species is known on Shikotan Island (Chesnokov, Konoreva, 2022).

Flavoplaca flavocitrina (Nyl.) Arup et al.: “Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Rudnyi cordon, right bank of Severyanka river, 44°20'20.9"N, 146°00'44.3"E, alt. 12 m, *Ulmus-Acer*-tall grass community, on stone. 06 VI 2019. L. A. Konoreva 77, 78” (VBGI 141456). – In the Sakhalin Region, the species is known on the islands of Sakhalin (Davydov et al., 2021a), Shikotan (Chesnokov, Konoreva, 2022).

Lichenomphalia umbellifera (L.: Fr.) Redhead et al.: “Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Saratovskiy cordon, left bank of Saratovskaya River, 44°15'58.3"N, 146°06'20.3"E, alt. 21 m, *Betula-Abies-Picea* forest, on rotten wood. 05 VI 2019. S. V. Chesnokov 30” (VBGI 120808). – In the Sakhalin Region, the species is known on the islands of Sakhalin (Davydov et al., 2021b), Shikotan (Davydov et al., 2021b; Chesnokov, Konoreva, 2022; Ezhkin, 2022a).

Micarea hedlundii Coppins: “Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Saratovskiy cordon, left bank of Saratovskaya River, 44°16'21.7"N, 146°06'36.4"E, alt. 28 m, *Picea* forest with *Betula ermanii* and fern, on roots of *Picea* sp. 04 VI 2019. S. V. Chesnokov 18” (in LE L-27523). – In the Sakhalin Region, the species is known on the islands of Sakhalin (Konoreva et al., 2019), Shikotan (Konoreva et al., 2019; Chesnokov, Konoreva, 2022).

Micarea melaena (Nyl.) Hedl.: “Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Saratovskiy cordon, left bank of Saratovskaya River, 44°16'21.7"N, 146°06'36.4"E, alt. 28 m, *Picea* forest with *Betula ermanii* and fern, on roots of *Picea* sp. and wood. 04 VI 2019. S. V. Chesnokov 18, L. A. Konoreva 16” (LE L-27521, VBGI 141436); “Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, caldera of Golovnin volcano, 43°51'34.4"N, 145°30'21.9"E, alt. 145 m, *Picea* sp. forest near creek, on wood of *Pinus pumila*. 10 VI 2019. S. V. Chesnokov 94” (VBGI 121900). – In the Sakhalin Region, the species is known on the islands of Sakhalin (Konoreva et al., 2018), Shikotan (Chesnokov, Konoreva, 2022).

Micarea misella (Nyl.) Hedl.: “Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Saratovskiy cordon, left bank of Saratovskaya River, 44°16'09.6"N, 146°06'23.1"E, alt. 23 m, *Picea ajanensis-Betula* sp. forest, on rotten wood. 04 VI 2019. L. A. Konoreva

12” (LE L 27527); “Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Saratovskiy cordon, left bank of Saratovskaya River, 44°16'21.7"N, 146°06'36.4"E, alt. 28 m, *Picea* forest with *Betula ermanii* and fern, on rotten wood of *Picea* sp. 04 VI 2019. S. V. Chesnokov 16” (LE L-27535). – In the Sakhalin Region, the species is known on the islands of Iturup (Konoreva et al., 2021) and Shikotan (Chesnokov, Konoreva, 2022).

Micarea peliocarpa (Anzi) Coppins et R. Sant.: “Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, right bank of Mostovaya River, 44°12'49.3"N, 146°01'41.1"E, alt. 67 m, *Betula-Picea-Abies* forest, on rotten wood of *Abies sachalinensis*. 06 VI 2019. S. V. Chesnokov 46” (LE L-27546); “Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Andreevskiy cordon, left bank of Andreevka River, 43°53'18.6"N, 145°37'18.7"E, alt. 27 m, floodplain mixed forest, on bark of *Alnus* sp. 09 VI 2019. S. V. Chesnokov 78” (VBGI 141409, in VBGI 141408); “Russia, Sakhalin Region, Kunashir Island, neighborhood of the Mendelev volcano, 43°59'24.5"N, 145°43'24.5"E, alt. 328 m, *Betula-Abies* forest on slope, on bark of *Sorbus* sp. and mosses. 12 VI 2019. S. V. Chesnokov 122, 123” (VBGI 121904, in LE L-27493). – In the Sakhalin Region, the species is known on the islands of Iturup (Konoreva et al., 2021) and Shikotan (Konoreva et al., 2021; Chesnokov, Konoreva, 2022).

Naevia punctiformis (Ach.) A. Massal.: “Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, caldera of Golovnin volcano, the shore of the Goryachee Lake, 43°51'48.4"N, 145°30'46.0"E, alt. 135 m, *Betula-Salix-Alnus-Sasa kurilensis* forest, on bark of *Alnus* sp. 10 VI 2019. S. V. Chesnokov 105” (LE L-27509). – In the Sakhalin Region, the species is known on the islands of Iturup (Chesnokov, Konoreva, 2021) and Sakhalin (Konoreva et al., 2020).

Physconia perisidiosa (Erichsen) Moberg: “Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Andreevskiy cordon, 43°53'21.5"N, 145°37'12.1"E, alt. 28 m, *Quercus-Betula* tall grass forest, on bark of *Quercus mongolica*. 09 VI 2019. L. A. Konoreva 123” (VBGI 171211). – In the Sakhalin Region, the species is known on Shikotan Island (Chesnokov, Konoreva, 2022).

+***Sarea resinae*** (Fr.) Kuntze: “Russia, Sakhalin Region, Kunashir Island, Yuzhno-Kurilsk, the vicinity of Serebryanoe Lake, 44°03'24.2"N, 145°50'17.2"E,

alt. 14 m, *Picea ajanensis* forest, on resin of *Picea ajanensis*. 03 VI 2019. S. V. Chesnokov 5" (in KPABG 21442); "Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Saratovskiy cordon, left bank of Saratovskaya River, 44°16'21.7"N, 146°06'36.4"E, alt. 28 m, *Picea* forest with *Betula ermanii* and fern, on resin of *Picea* sp. 04 VI 2019. S. V. Chesnokov 16" (in LE L-27536); "Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Andreevskiy cordon, 43°53'21.5"N, 145°37'12.1"E, alt. 28 m, *Quercus-Betula* tall grass forest, on resin of *Picea* sp. 09 VI 2019. S. V. Chesnokov 85" (VBGI 121898); "Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Andreevskiy cordon, 43°51'06.7"N, 145°34'22.6"E, alt. 85 m, *Abies-Picea* forest near creek, on resin of *Picea* sp. 09 VI 2019. L. A. Konoreva 102, S. V. Chesnokov 73" (VBGI 171206, VBGI 171132). – In the Sakhalin Region, the species is known on the islands of Sakhalin (Tchabanenko et al., 2018), Shikotan (Chesnokov, Konoreva, 2022).

Scoliciosporum chlorococcum (Graewe ex Stenh.) Vězda: "Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Kal'dernyi cordon, 43°51'31.3"N, 145°30'48.0"E, alt. 175 m, *Salix* sp. forest along creek with *Betula* sp., on bark of *Salix* sp. 10 VI 2019. S. V. Chesnokov 100" (in LE L-27496). – In the Sakhalin Region, the species is known on the islands of Sakhalin (Konoreva et al., 2020; Skirina et al., 2021), Iturup (Chesnokov, Konoreva, 2021), and Shikotan (Chesnokov, Konoreva, 2022).

Sticta fuliginosa (Dicks.) Ach.: "Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature Reserve, neighborhood of the Andreevskiy cordon, 43°53'21.5"N, 145°37'12.1"E, alt. 28 m, *Quercus-Betula* tall grass forest, on bark of *Ulmus* sp. and *Quercus mongolica*. 09 VI 2019. S. V. Chesnokov 86, L. A. Konoreva 123" (ALTB, LE L-27540, VBGI 121897, 141473). – In the Sakhalin Region, the species is known on the islands of Sakhalin (Skirina et al., 2016; Kaganov, Ezhkin, 2019; Tchabanenko, 2019), Shikotan (Chesnokov, Konoreva, 2022). A large foliose lichen, easily recognizable by its brown upper surface with scattered isidia, and beige densely tomentose lower surface with scattered rounded pseudocyphellae (Tchabanenko, 2019). The species is included in the Red Book of Russia (Urbanavichene, Makryi, 2024) and the Sakhalin Region (Tchabanenko, 2019).

Xylographa hians Tuck.: "Russia, Sakhalin Region, Kunashir Island, Kurilskiy State Nature

Reserve, neighborhood of the Saratovskiy cordon, 44°15'41.4"N, 146°06'26.0"E, alt. 10 m, *Picea-Abies* forest with *Sasa kurilensis* by the seashore, on rotten wood of *Abies sachalinensis*. 05 VI 2019. L. A. Konoreva 50" (LE L-27533). – In the Sakhalin Region, the species is known on the Shikotan Island (Chesnokov, Konoreva, 2022).

Xylographa opegraphella Nyl.: "Russia, Sakhalin Region, Kunashir Island, neighborhood of Yuzhno-Kurilsk, 44°02'01.9"N, 145°49'17.3"E, alt. 13 m, swampy sparse *Picea* forest, on branches of *Picea* sp. 13 VI 2019. S. V. Chesnokov 131" (VBGI 141423). – In the Sakhalin Region, the species is known on the islands of Sakhalin (Konoreva et al., 2018; Skirina et al., 2021), Shikotan (Ezhkin, 2022a).

Excluded taxa for the Sakhalin Region

Agonimia tristicula (Nyl.) Zahlbr. – A revision of the *A. tristicula* specimens (ALTB, LE L-18641, 18579) previously published from Shikotan Island (Chesnokov, Konoreva, 2022) showed that they belong to *A. pacifica*. For the differences between *A. pacifica* and *A. tristicula*, see the comments under *A. pacifica*.

Micarea xanthonica Coppins et Tønsberg – A revision of the *Micarea xanthonica* previously published from Kunashir Island (Davydov et al., 2021b) showed that it belongs to *Biatora pontica*. Sterile specimens of *B. pontica* are difficult to distinguish from *Micarea xanthonica*. Both have a light green or yellowish-green thallus, contain xanthonenes, and small photobiont cells, 4–7 µm in diam. The soredia of *Biatora pontica* resemble goniocysts of *Micarea xanthonica* and are of similar size, 15–30 µm in diam. The species can be distinguished by the structure of the thallus: in *Biatora pontica*, the thallus is often uniformly leprous due to merging soralia, while in *Micarea xanthonica*, the goniocysts fuse to form proliferating granules resembling isidia (Coppins, Tønsberg, 2001; Printzen, Tønsberg, 2003).

This study documents a total of 36 lichen species, all of which are new to Kunashir Island. Among these, *Agonimia pacifica* and *Parmelia marmorophylla* are reported for the first time in Russia. Additionally, *Cliostomum leprosum*, *Pseudosagedia borrieri*, *Thelocarpon superellum*, and *Trapelia corticola* are newly recorded for the Russian Far East. Species such as *Julella sericea*, *Micarea botryoides*, and *Muellerella lichenicola* are reported for the first time in the Sakhalin Region. Notably, *Alyxoria culmigena*, *Biatora pacifica*, *Cladonia phyllophora*,

Lepra ophthalmiza, *Mycobilimbia pilularis*, and *Sarea difformis* have not been previously reported for the Kuril Islands. As a result, the total number of known lichens and lichenicolous fungi species on Kunashir Island has now increased to 430.

Kunashir Island, with its well-developed infrastructure and accessibility, stands out as one of the most thoroughly studied and species-rich areas among the Kuril Islands. However, the current checklist of lichens remains incomplete. It is evident that lichenicolous fungi and certain lichen groups are still under-researched, particularly genera such as *Arthonia* Ach., *Bacidia* De Not., *Caloplaca* Th. Fr. s. lat., *Lepraria* Ach., *Micarea* Fr., *Pertusaria* DC. s. lat., and *Pyrenula* Ach.

Although Kunashir Island's mountainous landscape offers a variety of habitats, saxicolous lichens are notably underrepresented, comprising only 5.4 % of the identified species. The majority of the lichen community consists of corticolous and lignicolous species, accounting for 76.1 %, while terricolous species make up 17.8 %. The limited

presence of saxicolous lichens can be attributed both to a lack of specific studies on rocky substrates and to the inaccessibility of these habitats for lichens. In forested areas, boulders often lack lichens to dense grass cover, which hinders their establishment, or they are quickly overgrown with moss. Frequent volcanic ash emissions inhibit lichen colonization above 1000 m. The most promising research sites include coastal cliffs and boulders, which could host species from genera such as *Acarospora* A. Massal., *Aspicilia* A. Massal., *Caloplaca* s. lat., *Lecanora* Ach. s. lat., *Lecidea* Ach., and *Miriquidica* Hertel et Rambold, among others. Based on our observations, it is estimated that saxicolous lichens may constitute no more than 10–15 % of the total lichen species on Kunashir Island.

Acknowledgments

This research was supported by the Russian Science Foundation under grant no. 25-24-00070 “The island effect in the lichen biota of Kuril Islands” (<https://rscf.ru/en/project/25-24-00070/>).

REFERENCES / ЛІТЕРАТУРА

- Aptroot A.** 2002a. New and interesting lichens and lichenicolous fungi in Brazil. *Fungal Diversity* 9: 15–45.
- Aptroot A.** 2002b. *Jullela*. In: *Lichen Flora of the Greater Sonoran Desert Region. Volume I (the pyrenolichens and most of the squamulose and macro lichens)*. Arizona: Tempe. Pp. 254–256.
- Aptroot A.** 2003. Pyrenocarpous lichens and related non-lichenized ascomycetes from Taiwan. *J. Hattori Bot. Lab.* 93: 155–173.
- Aptroot A.** 2008. Lichens of St Helena and Ascension Island. *Bot. J. Linn. Soc.* 158(1): 147–171. <https://doi.org/10.1111/j.1095-8339.2008.00797.x>
- Aptroot A., Diederich P., Sérusiaux E., Sipman H. J. M.** 1997. Lichens and lichenicolous fungi from New Guinea. *Biblioth. Lichenol.* 64: 1–220.
- Aptroot A., Lücking R., Sipman H. J. M., Umaña L., Chaves J. L.** 2008. Pyrenocarpous lichens with bitunicate asci: A first assessment of the lichen biodiversity inventory in Costa Rica. *Biblioth. Lichenol.* 97: 1–162. [https://doi.org/10.3158/0015-0746\(2008\)46\[1:AFAOTT\]2.0.CO;2](https://doi.org/10.3158/0015-0746(2008)46[1:AFAOTT]2.0.CO;2)
- Aptroot A., Saipunkaew W., Sipman H. J. M., Sparrius L. B., Wolseley P. A.** 2007. New lichens from Thailand, mainly microlichens from Chiang Mai. *Fungal Diversity* 24: 75–134.
- Aptroot A., Sparrius L. B.** 2006. Additions to the lichen flora of Vietnam, with an annotated checklist and bibliography. *Bryologist* 109(3): 358–371. [https://doi.org/10.1639/0007-2745\(2006\)109\[358:ATTLFO\]2.0.CO;2](https://doi.org/10.1639/0007-2745(2006)109[358:ATTLFO]2.0.CO;2)
- Atlas Kurilskikh ostrovov [Atlas of the Kuril Islands]*. 2009. V. M. Kotlyakov, P. Ya. Baklanov, N. N. Komedchikov (eds.). Moscow, Vladivostok: IPC DIC. 516 pp. [In Russian] (*Атлас Курильских островов*. Отв. ред. В. М. Котляков, П. Я. Бакланов, Н. Н. Комедчиков. М., Владивосток: ИПЦ «ДИК», 2009. 516 с.).
- Barkalov V. Yu., Eremenko N. A.** 2003. *Flora prirodnogo zapovednika “Kurilskiy” i zakaznika “Malye Kurily” (Sakhalinskaya oblast) [Flora of the Kurilsky Nature Reserve and the Malye Kurily Sanctuary (Sakhalin Region)]*. Vladivostok: Dalnauka. 285 pp. [In Russian] (**Баркалов В. Ю., Еременко Н. А.** Флора природного заповедника «Курильский» и заказника «Малые Курилы» (Сахалинская область). Владивосток: Дальнаука, 2003. 285 с.).
- Blum O. B., Knyazheva L. A.** 1974. On new and rare for the USSR findings of lichens of the family Stictaceae from the Far East. *Ukrainskiy botanicheskiy zhurnal [Ukrainian Botanical Journal]* 31(3): 311–316. [In Ukrainian] (**Блюм О. Б., Княжева Л. А.** Про нові та рідкісні для СРСР знахідки лишайників родини Stictaceae з Далекого Сходу // Укр. ботан. журн., 1974. Т. 31, № 3. С. 311–316).
- Bogacheva A. V., Bulakh E. M., Bukharova N. V., Galanina I. A., Egorova L. N., Ezhkin A. K., Petrunenko E. A.** 2018. *Mycobiota of the Far Eastern oak forests*. Vladivostok: Dalnauka. 200 pp. [In Russian] (**Богачева А. В., Булах Е. М., Бухарова Н. В., Галанина И. А., Егорова Л. Н., Ежкин А. К., Петруненко Е. А.** Микобиота дальневосточных дубняков. Владивосток: Дальнаука, 2018. 200 с.).

- Bredkina L. I., Dobrysh A. A., Makarova I. I., Titov A. N.** 1992. To the lichen flora of Kunashir Island (Kuril Islands). *Novosti Sist. Nizsh. Rast.* 28: 90–94. [In Russian] (**Бредкина Л. И., Добрыш А. А., Макарова И. И., Титов А. Н.** К флоре лишайников о-ва Кунашир (Курильские острова) // *Новости сист. низш. раст.*, 1992. Т. 28. С. 90–94).
- Bungartz F., Ziemmeck F., Yáñez Ayabaca A., Nugra F., Aptroot A.** 2013. CDF checklist of Galapagos lichenized fungi. In: *Charles Darwin Foundation Galapagos Species Checklist*. Puerto Ayora, Galapagos: Charles Darwin Foundation. URL: <https://www.darwinfoundation.org/en/datazone/checklist> (Accessed 13 March 2025).
- Chesnokov S. V., Konoreva L. A.** 2021. Addition to the lichen flora of Iturup Island (Sakhalin Region, Russian Far East). *Novosti Sist. Nizsh. Rast.* 55(2): 379–392. <https://doi.org/10.31111/nsnr/2021.55.2.379>
- Chesnokov S. V., Konoreva L. A.** 2022. Checklist of lichens of Shikotan Island (Southern Kuril Islands, Russian Far East). *Novosti Sist. Nizsh. Rast.* 56(2): 413–439. <https://doi.org/10.31111/nsnr/2022.56.2.413>
- Coppins B. J., Tønsberg T.** 2001. A new xanthone-containing *Micarea* from Northwest Europe and the Pacific Northwest of North America. *Lichenologist* 33(2): 93–96. <https://doi.org/10.1006/lich.2000.0311>
- Davydov E. A., Yakovchenko L. S., Galanina I., Paukov A., Frolov I., Ahti T.** 2021a. New records of lichens from the Russian Far East. III. Lichens of coastal habitats. *Turczaninowia* 24, 1: 25–36. <https://doi.org/10.14258/turczaninowia.24.1.4>
- Davydov E. A., Yakovchenko L. S., Konoreva L. A., Chesnokov S. V., Ezhkin A., Galanina I., Paukov A.** 2021b. New records of lichens from the Russian Far East. II. Species from forest habitats. *Opusc. Philolichenum* 20: 54–70. <https://doi.org/10.13158/heia.33.2.2020.455>
- de Lange P., Blanchon D., Knight A., Elix J., Lücking R., Frogley K., Harris A., Cooper J., Rolfe J.** 2018. *Conservation status of New Zealand indigenous lichens and lichenicolous fungi*, 2018. Wellington: Publishing Team. 64 pp.
- Diederich P., Lawrey J. D., Ertz D.** 2018. The 2018 classification and checklist of lichenicolous fungi, with 2000 non-lichenized, obligately lichenicolous taxa. *Bryologist* 121(3): 340–425. <https://doi.org/10.1639/0007-2745-121.3.340>
- Diederich P., Lücking R., Aptroot A., Sipman H. J. M., Braun U., Ahti T., Ertz D.** 2017. New species and new records of lichens and lichenicolous fungi from the Seychelles. *Herzogia* 30(1): 182–236. <https://doi.org/10.13158/heia.30.1.2017.182>
- Dombrovskaya A. V.** 1996. *Rod Stereocaulon na territorii byvshego SSSR [The genus Stereocaulon on the territory of former USSR]*. St. Petersburg: Mir i semya. 265 pp. [In Russian] (**Домбровская А. В.** Род *Stereocaulon* на территории бывшего СССР. СПб.: Мир и семья, 1996. 265 с.).
- Ezhkin A. K.** 2019. Addition to lichen biota of the “Kurilskiy” Reserve (the Kunashir Island). *Bulluten Botanicheskogo sada-instituta DVO RAN [Bulletin of the Botanical Garden-Institute of the Far Eastern Branch of the Russian Academy of Sciences]* 22: 36–43. [In Russian] (**Ежкин А. К.** Дополнения к лихенобиоте заповедника «Курильский» (о-в Кунашир) // Бюлл. БСИ ДВО РАН, 2019а. Вып. 22. С. 36–43). <https://doi.org/10.17581/bbgi2204>
- Ezhkin A. K.** 2020a. Lichens of the “Lagunoozernyy Relict Forest” Protected Area on Kunashir Island. *Biota and Environment of Protected Areas* 2: 38–48. [In Russian] (**Ежкин А. К.** Лишайники памятника природы «Лагуноозёрный реликтовый лес» (остров Кунашир) // Биота и среда заповедных территорий, 2020а. Вып. 2. С. 38–48).
- Ezhkin A. K.** 2020b. Lichens of the Natural Monument “Highlands of Chekhov Mountain”, Sakhalin Island. *Biota and Environment of Protected Areas* 4: 25–38. [In Russian] (**Ежкин А. К.** Лишайники памятника природы «Высокогорья горы Чехова» (остров Сахалин) // Биота и среда заповедных территорий, 2020b. № 4. С. 25–38).
- Ezhkin A. K.** 2022a. Lichens of relic larch forests on Shikotan Island (Kurile Islands). *Vestnik sakhalinskogo muzeya [Bulletin of the Sakhalin Museum]* 4: 20–29. [In Russian] (**Ежкин А. К.** Лишайники реликтовых лиственничников о. Шикотан (Курильские острова) // Вестник Сахалинского музея, 2022а. № 4. С. 20–29).
- Ezhkin A. K.** 2022b. Epigeic lichens in thermal habitats on the Southern Kuriles. *Geosystems of Transition Zones* 6(4): 380–387. [In Russian] (**Ежкин А. К.** Напочвенные лишайники термальных местообитаний южных Курильских островов // Геосистемы переходных зон, 2022b. Т. 6, № 4. С. 380–387). <https://doi.org/10.30730/gtr.2022.6.4.380-387>
- Ezhkin A. K.** 2023. Addition to the lichen flora of Shikotan Island (Southern Kurils). *Bulletin of the North-East Science Center Far East Branch of Russia Academy of Sciences* 2: 65–75. [In Russian] (**Ежкин А. К.** Дополнение к флоре лишайников острова Шикотан (Южные Курилы) // Вестник Северо-Восточного научного центра ДВО РАН, 2023. № 2. С. 65–75). <https://doi.org/10.34078/1814-0998-2023-2-65-75>
- Ezhkin A. K., Davydov E. A.** 2024. *Fuscopannaria mediterranea* and *F. sorediata* (Pannariaceae, lichenized Ascomycota), new records for the Far East of Russia. *Bot. Pacifica* 13, 1: 55–59. <https://doi.org/10.17581/bp.2024.13107>
- Ezhkin A. K., Davydov E. A., Frolov I. V., Korznikov K. A.** 2025. New records and noteworthy lichen species from Sakhalin and Kurils, Far East of Russia. *Bot. Pacifica* 14, 1: 177–180. <https://doi.org/10.17581/bp.2025.14108>
- Ezhkin A. K., Jørgensen P. M.** 2018. New records of Pannariaceae (Lichenized Ascomycota) from Sakhalin and the Kuril Islands, Russian Far East. *Evansia* 35(2): 43–52. <https://doi.org/10.1639/0747-9859-35.2.043>
- Ezhkin A. K., Schumm F.** 2018. New and noteworthy records of lichens and allied fungi from Sakhalin Island, Russian Far East, II. *Folia Cryptog. Estonica* 55: 45–50. <https://doi.org/10.12697/fce.2018.55.06>
- Gagarina L. V., Ezhkin A. K.** 2020. To the study of the lichen genus *Usnea* (Parmeliaceae) in Kunashir Island (Sakhalin Region, Russia). *Novosti Sist. Nizsh. Rast.* 54(2): 467–478. <https://doi.org/10.31111/nsnr/2020.54.2.467>

- Galanina I. A.** 2016. Addition to the lichen biota of tukulans, dune complexes of Central Yakutia. *Bot. Zhurn.* 101(12): 1486–1497. [In Russian] (**Галанина И. А.** Дополнение к лишенобиоте дюнных комплексов (Тукуланов) Центральной Якутии // Бот. журн., 2016. Т. 101, № 12. С. 1486–1497). <https://doi.org/10.1134/S0006813616120097>
- Galanina I. A., Ezhkin A. K.** 2019. Genus *Rinodina* in the Kuril Islands (Russian Far East). *Turczaninowia* 22, 4: 5–16. <https://doi.org/10.14258/turczaninowia.22.4.1>
- Gerasimova J. V., Ezhkin A. K., Beck A.** 2018. Four new species of *Bacidia* s. s. (Ramalinaceae, Lecanorales) in the Russian Far East. *Lichenologist* 50(6): 603–625. <https://doi.org/10.1017/S0024282918000397>
- Golubkova N. S.** 1994. Oceanic species of the genus *Usnea* (Usneaceae) in the lichen flora of the Far East (Russia). *Bot. Zhurn.* 79(3): 64–69. [In Russian] (**Голубкова Н. С.** Океанические виды рода *Usnea* (Usneaceae) в лишенофлоре Дальнего Востока (Россия) // Бот. журн., 1994. Т. 79, № 3. С. 64–69).
- Hafellner J.** 1997. A world monograph of *Brigantiaea* (lichenized Ascomycotina, Lecanorales). *Symb. Bot. Upsal.* 32(1): 35–74.
- Harada H.** 1993. *Agonimiella*, a new genus in the family Verrucariaceae (Lichenes). *Nova Hedwigia* 57(3–4): 503–510.
- Himelbrant D. E., Stepanchikova I. S., Kuznetsova E. S., Motiejūnaitė J., Konoreva L. A.** 2018. Konevets Island (Leningrad Region, Russia) – a historical refuge of lichen diversity in Lake Ladoga. *Folia Cryptog. Estonica* 55: 51–78. <https://doi.org/10.12697/fce.2018.55.07>
- Insarov G. E., Pchelkin A. V.** 1988. *Kolichestvennyye kharakteristiki sostoyaniya epifitnoy likhenoflory Kuril'skogo zapovednika* [Quantitative characteristics of the state of epiphytic lichen flora of Kurilsky Reserve]. Moscow. 174 pp. [In Russian] (**Инсаров Г. Э., Пчелкин А. В.** Количественные характеристики состояния эпифитной лишенофлоры Курильского заповедника. М., 1988. 174 с.).
- Joneson S., Kashiwadani H., Tschabanenko S., Gage S.** 2004. *Ramalina* of the Kuril Islands. *Bryologist* 107(1): 98–106. [https://doi.org/10.1639/0007-2745\(2004\)107\[98:ROTKI\]2.0.CO;2](https://doi.org/10.1639/0007-2745(2004)107[98:ROTKI]2.0.CO;2)
- Kaganov V. V., Ezhkin A. K.** 2019. New habitats of protected species of lichens found on the Sakhalin Island. *Bulleten Botanicheskogo sada-instituta DVO RAN* [Bulletin of the Botanical Garden-Institute of the Far Eastern Branch of the Russian Academy of Sciences] 21: 1–8. [In Russian] (**Каганов В. В., Ежкин А. К.** Новые местонахождения редких и охраняемых лишайников с острова Сахалин // Бюлл. БСИ ДВО РАН, 2019. Вып. 21. С. 1–8). <https://doi.org/10.17581/bbgi2101>
- Kalb K., Buaruang K., Mongkolsuk P., Boonpragob K.** 2012. New or otherwise interesting lichens. VI, including a lichenicolous fungus. *Phytotaxa* 42: 35–47. <https://doi.org/10.11646/phytotaxa.42.1.5>
- Kerr A. M.** 2014. Catalogue of the Lichens of the Mariana Islands ex Elix & McCarthy's (2008) Checklist of Pacific Island Lichens. *University of Guam Marine Laboratory Technical Report* 157: 1–48.
- Kirika P. M., Mugambi G., Lücking R., Lumbsch H. T.** 2012. New records of lichen-forming fungi from Kenya. *J. E. Afr. Nat. Hist.* 101(1): 73–98. <https://doi.org/10.2982/028.101.0105>
- Kondratyuk S., Lököš L., Tschabanenko S., Haji Moniri M., Farkas E., Wang X., Oh S.-O., Hur J. S.** 2013. New and noteworthy lichen-forming and lichenicolous fungi. *Acta Bot. Hung.* 55(3–4): 275–349. <https://doi.org/10.1556/ABot.55.2013.3-4.9>
- Kondratyuk S. Y., Lököš L., Farkas E., Kärnefelt I., Thell A., Yamamoto Y., Hur J.-S.** 2020. Three new genera of the Teloschistaceae proved by three gene phylogeny. *Acta Bot. Hung.* 62(1–2): 109–136. <https://doi.org/10.1556/034.62.2020.1-2.7>
- Konoreva L., Chesnokov S., Kuznetsova E., Stepanchikova I.** 2019. Remarkable records of *Micarea* from the Russian Far East and significant extension of *M. laeta* and *M. microareolata* Range. *Botanica* 25(2): 186–201. <https://doi.org/10.2478/botlit-2019-0020>
- Konoreva L. A., Chesnokov S. V., Tagirdzhanova G. M.** 2021. Remarkable records of *Micarea* (Pilocarpaceae) from the Russian Far East. II. *Novosti Sist. Nizsh. Rast.* 55(1): 163–177. <https://doi.org/10.31111/nsnr/2021.55.1.163>
- Konoreva L. A., Chesnokov S. V., Yakovchenko L. S., Ohmura Y., Davydov E. A.** 2020. New records to the lichen biota of Russia, 1 – Sakhalin Region, with new records for the Russian Far East and the Asian part of Russia. *Bot. Pacifica* 9, 2: 161–173. <https://doi.org/10.17581/bp.2020.09203>
- Konoreva L. A., Chesnokov S. V., Zheludeva E. V.** 2024. The genera *Micarea* and *Brianaria* in Magadan Region (Far East of Russia). *Asian J. Mycol.* 7, 2: 90–118. <https://doi.org/10.5943/ajom/7/2/7>
- Konoreva L. A., Tschabanenko S. I., Ezhkin A. K., Schumm F., Chesnokov S. V.** 2018. New and noteworthy lichen and allied fungi records from Sakhalin Island, Far East of Russia. *Herzogia* 31(1): 276–292. <https://doi.org/10.13158/099.031.0123>
- Kotkova V. M., Afonina O. M., Androsova V. I., Belyakov E. A., Bersanova A. N., Biryukova O. V., et al.** 2023. New cryptogamic records. 12. *Novosti Sist. Nizsh. Rast.* 57(2): R1–R58. [In Russian] (**Коткова В. М., Афонина О. М., Андросова В. И., Беляков Е. А., Берсанова А. Н., Бирюкова О. В., и др.** Новые находки водорослей, грибов, лишайников и мохообразных. 12 // Новости сист. низш. раст., 2023. Т. 57, вып. 2. С. R1–R58). <https://doi.org/10.31111/nsnr/2023.57.2.R1>
- Kurokawa S.** 1994a. Japanese species of *Parmelia* Ach. (sens. str.), Parmeliaceae (3). *J. Jpn. Bot.* 69: 204–213.
- Kurokawa S.** 1994b. Japanese species of *Parmelia* Ach. (sens. str.), Parmeliaceae (4). *J. Jpn. Bot.* 69: 262–269.

- Kuznetsova E., Ahti T., Himelbrant D.** 2007. Lichens and allied fungi of the Eastern Leningrad Region. *Norrinia* 16: 1–62.
- McCune B., Tchabanenko S.** 2001. *Hypogymnia arcuata* and *H. sachalinensis*, two new lichens from East Asia. *Bryologist* 104(1): 146–150. [https://doi.org/10.1639/0007-2745\(2001\)104\[0146:HAHST\]2.0.CO;2](https://doi.org/10.1639/0007-2745(2001)104[0146:HAHST]2.0.CO;2)
- Nauchno-prikladnoy spravochnik po klimatu. Seriya 3. Mnogoletniye dannyye. Vypusk 34. Sakhalinskaya oblast* [Scientific and Applied Handbook on Climate. Series 3. Long-term data. Issue 34. Sakhalin Region]. 1990. Leningrad: Gidrometeoizdat. 351 pp. [In Russian] (*Научно-прикладной справочник по климату. Серия 3. Многолетние данные. Вып. 34. Сахалинская область*. Л.: Гидрометеиздат, 1990. 351 с.).
- Nevedomskaya I. A.** 1998. Nature of Kunashir Island. *Vestnik sakhalinskogo muzeya* [Bulletin of the Sakhalin Museum] 1(5): 288–297. [In Russian] (**Неведомская И. А.** Природа острова Кунашир // Вестник сахалинского музея, 1998. № 1(5). С. 288–297).
- Orange A., James P. W., White F. J.** 2001. *Microchemical methods for the identification of lichens*. London: British Lichen Society. 101 pp.
- Oxner A. N., Blum O. B.** 1971. To the lichen flora of the Soviet Far East. I. Family Peltigeraceae. *Novosti Sist. Nizsh. Rast.* 8: 249–263. [In Russian] (**Окснер А. Н., Блюм О. Б.** К флоре лишайников Советского Дальнего Востока. I. Сем. Peltigeraceae // Новости сист. низш. раст., 1971. Т. 8. С. 249–263).
- Popov E. S., Chesnokov S. V., Konoreva L. A., Ezhkin A. K., Stepanchikova I. S., Kuznetsova E. S., Himelbrant D. E., Galanina I. A., Tchabanenko S. I.** 2020. *Stictis* s. l. (Ostropales, Ascomycota) in the Russian Far East. *Bot. Pacifica* 9, 2: 95–102. <https://doi.org/10.17581/bp.2020.09201>
- Printzen C., Halda J. P., McCarthy J. W., Palice Z., Rodriguez-Flakus P., Thor G., Tønsberg T., Vondrák J.** 2016. Five new species of *Biatora* from four continents. *Herzogia* 29(2): 566–585. <https://doi.org/10.13158/heia.29.2.2016.566>
- Printzen C., Tønsberg T.** 2003. Four new species and three new apothecial pigments of *Biatora*. *Biblioth. Lichenol.* 94: 133–145.
- Randlane T. V., Saag A. Y.** 1992. Genus *Cetrelia* Culb. et Culb. in USSR. *Novosti Sist. Nizsh. Rast.* 28: 118–134. [In Russian] (**Рандлане Т. В., Сааг А. Ю.** Род *Cetrelia* Culb. et Culb. в Советском Союзе // Новости сист. низш. раст., 1992. Т. 28. С. 118–134).
- Randlane T., Saag A.** 1998. Synopsis of the genus *Nephromopsis* (Fam. Parmeliaceae, lichenized Ascomycota). *Cryptog. Bryol. Lichenol.* 19(2–3): 175–191.
- Randlane T., Thell A., Saag A.** 1995. New data about the genera *Cetrariopsis*, *Cetrelia* and *Nephromopsis* (fam. Parmeliaceae, lichenized Ascomycotina). *Cryptog. Bryol. Lichenol.* 16(1): 35–60.
- Rassadina K. A.** 1968. Some interesting and rare *Parmelia* from the subgenus *Melanoparmelia*. *Novosti Sist. Nizsh. Rast.* 5: 248–250. [In Russian] (**Рассадина К. А.** О некоторых интересных и малоизвестных *Parmelia* из подрода *Melanoparmelia* // Новости сист. низш. раст., 1968. Т. 5. С. 248–250).
- Satō M.** 1936. Notes on the lichen flora of Tisima or the Kuriles. *Bot. Mag.* 50: 610–617. <https://doi.org/10.15281/jplantres1887.50.610>
- Sedelnikova N. V.** 2013. Species diversity of Lichen Biota of the Altai-Sayan ecological region. *Plant Life of Asian Russia* 2(12): 12–54. [In Russian] (**Седельникова Н. В.** 2013. Видовое разнообразие лишайнобиоты Алтае-Саянского экорегиона // Растительный мир Азиатской России, 2013. № 2(12). С. 12–54).
- Skirina I. F.** 2015. Lichen list of “Bastak” natural reserve (Russia). *Biodiversity and Environment of Far East Reserves* 4: 28–87. [In Russian] (**Скирина И. Ф.** Список лишайников заповедника «Бастак» // Биота и среда заповедников Дальнего Востока, 2015. № 4. С. 28–87).
- Skirina I. F., Salokhin A. V., Tsarenko N. A., Skirin F. V.** 2016. New locations of protected lichens of Sakhalin island. *Turczaninowia* 19, 2: 54–63. [In Russian] (**Скирина И. Ф., Салохин А. В., Царенко Н. А., Скирин Ф. В.** 2016. Новые местонахождения редких и охраняемых лишайников острова Сахалин // Turczaninowia, 2016. Т. 19, № 2. С. 54–63). <https://doi.org/10.14258/turczaninowia.19.2.6>
- Skirina I. F., Tsarenko N. A., Skirin F. V.** 2021. Lichen flora of the marsh complexes of Sakhalin Island (Sakhalin Region, Russian Far East). *Novosti Sist. Nizsh. Rast.* 55(2): 405–426. [In Russian] (**Скирина И. Ф., Царенко Н. А., Скирин Ф. В.** Лишенофлора болотных комплексов острова Сахалин (Сахалинская область, Российский Дальний Восток) // Новости сист. низш. раст., 2021. Т. 55, вып. 2. С. 405–426). <https://doi.org/10.31111/nsnr/2021.55.2.405>
- The Lichens of Great Britain and Ireland.* 2009. C. W. Smith, A. Aptroot, B. J. Coppins, A. Fletcher, O. L. Gilbert, P. W. James, P. A. Wolseley (eds.). London: The British Lichen Society. 1046 pp.
- Stepanchikova I. S., Gagarina L. V.** 2014. Chapter 8. Collection, identification and storage of lichenological collections. In: *Flora lishaynikov Rossii. Biologiya, ekologiya, raznoobraziye, rasprostraneniye i metody izucheniya lishaynikov* [The lichen flora of Russia. Biology, ecology, diversity, distribution and methods to study lichens]. М. Р. Andreev, О. Е. Himelbrant (eds.). Moscow; St. Petersburg: KMK Scientific Press Ltd. Pp. 204–219. [In Russian] (**Степанчикова И. С., Гагарина Л. В.** Глава 8. Сбор, определение и хранение лихенологических коллекций // Флора лишайников России. Биология, экология, разнообразие, распространение и методы изучения лишайников. Отв. ред. М. П. Андреев, Д. Е. Гимельбрант. М.; СПб.: Тов-во науч. изд. КМК, 2014. С. 204–219).

Tchabanenko S. I. 1999. Lichens of the Kurilsky Nature Reserve (Kunashir Island). *Trudy botanicheskikh sadov DVO RAN* [Proceedings of the Botanical Gardens of the Far-Eastern Branch of the Russian Academy of Sciences] 1: 221–228. [In Russian] (**Чабаненко С. И.** Лишайники Курильского заповедника (остров Кунашир) // Тр. бот. садов ДВО РАН, 1999. Т. 1. С. 221–228).

Tchabanenko S. I. 2002. *Konspekt flory lishaynikov yuga Rossiiskogo Dalnego Vostoka* [Checklist of the lichen flora of the South of the Russian Far East]. Vladivostok: Dalnauka. 232 pp. [In Russian] (**Чабаненко С. И.** Конспект флоры лишайников юга Российского Дальнего Востока. Владивосток: Дальнаука, 2002. 232 с.).

Tchabanenko S. I. 2006. The species of the genus *Phaeophyscia* (Physciaceae) in the lichen flora of the southern Russian Far East. *Bot. Zhurn.* 91(2): 244–255. [In Russian] (**Чабаненко С. И.** Виды рода *Phaeophyscia* (Physciaceae) в лихенофлоре юга российского Дальнего Востока // Бот. журн., 2006. Т. 91, № 2. С. 244–255).

Tchabanenko S. I. 2019. *Sticta fuliginosa* (Hoffm.) Ach. In: *Krasnaya kniga Sakhalinskoy oblasti. Rasteniya i griby* [Red Data Book of the Sakhalin Region. Plants and fungi]. A. A. Taran, V. M. Eremin (eds). Kemerovo. P. 262. [In Russian] (**Чабаненко С. И.** Стикта тёмно-бурая – *Sticta fuliginosa* (Hoffm.) Ach. // Красная книга Сахалинской области: Растения и грибы. Отв. ред. А. А. Таран, В. М. Еремин. Кемерово, 2019. С. 262).

Tchabanenko S. I., Konoreva L. A., Chesnokov S. V. 2018. Lichens collected in the Sakhalin Botanical Garden: new records to Russia, the Russian Far East and Sakhalin Island. *Bot. Pacifica* 7, 1: 71–79. <https://doi.org/10.17581/bp.2018.07111>

Tibell L., Titov A. 1995. Species of *Chaenothecopsis* and *Mycocalicium* (Caliciales) on exudate. *Bryologist* 98(4): 550–560. <https://doi.org/10.2307/3243587>

Titov A. N. 2006. *Mycocalicioid fungi (the order Mycocaliciales) of Holarctic*. Moscow: KMK Scientific Press. 296 pp. [In Russian] (**Титов А. Н.** Микокалициевые грибы Голарктики. М.: Тов-во науч. изд. КМК, 2006. 296 с.).

Titov A., Tibell L. 1993. *Chaenothecopsis* in the Russian Far East. *Nordic J. Bot.* 13(3): 313–329. <https://doi.org/10.1111/j.1756-1051.1993.tb00055.x>

Trass H. 1963. *Glossodium japonicum* – a new lichen in the USSR. *Tartu Riikliku Ülikooli Toimetised* [Scientific Notes of Tartu State University] 136: 201–202. [In Russian] (**Трасс Х. Х.** *Glossodium japonicum* – новый лишайник в СССР // Ученые записки Тартуского государственного университета, 1963. Вып. 136. С. 201–202).

Trass H. 1979. New and rare taxa of Cladoniaceae in the lichen-flora of the USSR. *Folia Cryptog. Estonica* 11: 1–6. [In Russian] (**Трасс Х. Х.** Новые и интересные таксоны из семейства Cladoniaceae в лихенофлоре СССР // Folia Cryptog. Estonica, 1979. Т. 11. С. 1–6).

Urbanavichene I. N., Makryi T. V. 2024. *Sticta fuliginosa* (Hoffm.) Ach. In: *Krasnaya kniga Rossiyskoy Federatsii. Rasteniya i griby* [Red Book of the Russian Federation. Plants and Fungi]. D. V. Geltman (ed.). Moscow: VNII Ekologiya. P. 771. [In Russian] (**Урбанавичене И. Н., Макрый Т. В.** Стикта тёмно-бурая – *Sticta fuliginosa* (Hoffm.) Ach. // Красная книга Российской Федерации. Растения и грибы. Гл. ред. Д. В. Гельтман. М.: ВНИИ Экология, 2024. С. 771).

Urbanavichene I., Urbanavichus G. 2019. New records of lichens and allied fungi from the Kostroma Region, Russia. *Folia Cryptog. Estonica* 56: 53–62. <https://doi.org/10.12697/fce.2019.56.06>

Urbanavichus G. P., Vondrák Ya., Urbanavichene I. N. 2017. Genus *Porina* (Porinaceae, Lichenes) in the lichen flora of the Caucasus. *Bot. Zhurn.* 102(4): 563–576. [In Russian] (**Урбанавичюс Г. П., Вондрак Я., Урбанавичене И. Н.** Род *Porina* (Porinaceae, Lichenes) во флоре Кавказа // Бот. журн., 2017. Т. 102, № 4. С. 563–576). <https://doi.org/10.1134/S0006813617040081>

Urbanavichus G., Vondrák J., Urbanavichene I., Palice Z., Malíček J. 2020. Lichens and allied non-lichenized fungi of virgin forests in the Caucasus State Nature Biosphere Reserve (Western Caucasus, Russia). *Herzogia* 33(1): 90–138. <https://doi.org/10.13158/heia.33.1.2020.90>

Van den Boom P., Brand M., Ertz D., Kalb K., Magain N., Masson D., Schiefelbein U., Sipman H. J. M., Sérusiaux E. 2011. Discovering the lichen diversity of a remote tropical island: working list of species collected on Reunion (Mascarene archipelago, Indian Ocean). *Herzogia* 24(2): 325–349. <https://doi.org/10.13158/heia.24.2.2011.325>

Weerakoon G., Wolseley P. A., Arachchige O., da Silva Cáceres M. E., Jayalal U., Aptroot A. 2016. Eight new lichen species and 88 new records from Sri Lanka. *Bryologist* 119(2): 131–142. <https://doi.org/10.1639/0007-2745-119.2.131>

Westberg M., Moberg R., Myrdal M., Nordin A., Ekman S. 2021. *Santesson's checklist of Fennoscandian lichen-forming and lichenicolous fungi*. Uppsala. 933 pp.

Zhurbenko M. P., Himelbrant D. E., Kuznetsova E. S., Stepanchikova I. S. 2012. Lichenicolous fungi from the Kamchatka Peninsula, Russia. *Bryologist* 115(2): 295–312. <https://doi.org/10.1639/0007-2745-115.2.295>

Zueva A. S., Chesnokov S. V., Konoreva L. A. 2024. Addition to the lichen biota of Paramushir Island (Northern Kuril Islands, Russian Far East). *Novosti Sist. Nizsh. Rast.* 58(1): L35–L53. <https://doi.org/10.31111/nsnr/2024.58.1.L35>