LICHENS – ЛИШАЙНИКИ

The first survey of the lichen diversity of Seskar Island (Gulf of Finland, Leningrad Region)

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Abstract. The revealed lichen diversity of Seskar Island has a total of 292 species, including 263 lichenized, 20 lichenicolous, and nine non-lichenized saprobic fungi. *Stigmidium microcarpum* is new to European Russia, *Caloplaca alcarum*, *Cryptodiscus muriformis*, *C. pini*, and *C. tabularum* are new to North-Western European Russia; *Lecidella subviridis* and *Pyrenidium actinellum* are new to the Leningrad Region. The most interesting result of the investigation is the discovery of the single modern population of the red-listed *Flavocetraria nivalis* in the Leningrad Region. The lichen biota of Seskar Island is moderately rich compared to other islands of the Gulf of Finland.

Keywords: lichens, lichenicolous fungi, new records, protected species, North-West European Russia, State Nature Reserve "Vostok Finskogo Zaliva".

Первое исследование видового разнообразия лишайников острова Сескар (Финский залив, Ленинградская область)

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Резюме. Выявленное разнообразие лишайников острова Сескар насчитывает 292 вида, в том числе 263 вида лишайников, 20 лихенофильных и девять нелихенизированных

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сапротрофных грибов. *Stigmidium microcarpum* ранее не был известен из Европейской России, *Caloplaca alcarum*, *Cryptodiscus muriformis*, *C. pini* и *C. tabularum* обнаружены впервые на Северо-Западе европейской части России; *Lecidella subviridis* и *Pyrenidium actinellum* являются новыми для Ленинградской области. Наиболее значимым результатом исследования является находка единственной современной популяции *Flavocetraria nivalis* в Ленинградской области. Лихенофлора острова Сескар является умеренно богатой в сравнении с другими дальними островами Финского залива.

Ключевые слова: лишайники, лихенофильные грибы, новые находки, охраняемые виды, государственный природный заповедник «Восток Финского залива», Северо-Запад Европейской России.

This article inherits topic from previous papers, dedicated to the lichens and allied fungi of the islands in the Russian part of the Gulf of Finland, Baltic Sea. Recently detailed lichen checklists of Bolshoy Tuters (Stepanchikova *et al.*, 2017), Moshchny (Stepanchikova *et al.*, 2019), and Maly (Stepanchikova *et al.*, 2020) were published. Lichen diversity of Hogland, the largest island in the region, is being studied.

Seskar Island (former Seiskari) administratively belongs to the Kingisepp District of the Leningrad Region and biogeographically to Karelia australis, province of the Eastern Fennoscandia (Kotiranta *et al.*, 1998). The island is located in the Russian part of the Gulf of Finland (Fig. 1), 20 km north of the nearest shore of the Soikinsky Peninsula. Seskar is the easternmost of the remote islands (Suomenlahden ulkosaaret in Finnish) in the Gulf of Finland. The island itself occupies an area of ca. 4.5 km^2, and ca. 11 km^2 with in-shore islets, shoals, and spits counted. The largest islet in Seskar surroundings is Kokor (0.5 km^2). Western part of Seskar and all adjacent islets belong to the State Nature Reserve "Vostok Finskogo Zaliva" (Fig. 2). Landscape of Seskar is low flatland formed by quarternary marine sediments of sand and moraine granite boulders; the basement rock of Ediacarian origin is deeply hidden (Georastry, 2023). Therefore, the highest point of the island is 16 m.

Despite such a modest size, Seskar is quite rich in biotopes. While most parts of the island are predominately forested, its eastern shore is represented by dune complex (Fig. 3D) which extends from North to South and goes inland for 580 m. Dunes are mainly covered with open pine forest, mosses and lichens. Along other shores granite boulders are found; they form long spits (Fig. 3A, B) on northern and southern shores of the island and serve as core elements in the shoals of the western shore. Supralittoral communities dominated by *Leymus arenarius* (L.) Hochst., *Artemisia vulgaris* L., or *Phragmites australis* (Cav.) Trin. ex Steud. etc., are widely represented along the shoreline as well as on the islets. Pine forests (tree age approximately 55 years old) are the most common forest type. Sometimes small groups of older pines (to 180 years old) (Fig. 3C) can be found as well as groups of young or middle-aged spruces (in the northern part of the island). Black alder stands and willow communities occur along western shore. Birch stands can be found all over the island. Aspen stands occur rarely in local depressions. On the territory of the former villages domesticated and synanthropic trees such as apple trees, plum trees, pear trees, bird cherry, maple, and oak are

found. Kokor is the only forested islet in the archipelago of Seskar. Most part of Kokor is occupied by old growth pine forest, vegetation of the shores is typically supralittoral. Flora of vascular plants includes 455 species (Glazkova, 2001), mosses are represented by 37 species (Kurbatova, Noskova, 2002).

Seskar has a centuries-old settlement history. It was known as an inhabited island since no later than XVI century (Hamari *et al.*, 1996). It passed from one country to another during several wars between Russia, Sweden, and Finland. Finns inhabited the island for past three hundred years. By the middle of XIX century there were three villages which subsequently merged due to population growth (848 people in 1921, according to population census). In 1920^{s} there was a beach resort in the northern part of Seskar. Significant part of accessible territory of the island was used for pastures, cuttings, hayfields, and plantings. Thus, modern vegetation communities of Seskar are totally secondary (Glazkova, 2001). At the beginning of the Winter War (in 1939) Finnish population of the island was evacuated. The island became a part of the Soviet Union and a border control zone. During the World War II, the Soviet army built a runway strip in the northern part of the island. After the war Seskar was left desolate. Nowadays foundation ruins merely remain of prosperous Finnish villages (Fig. 3E), The Soviet border post is abandoned. The only people on the island are the lighthouse staff.

Fig. 1. Location of the study area: Seskar Island in the Gulf of Finland.

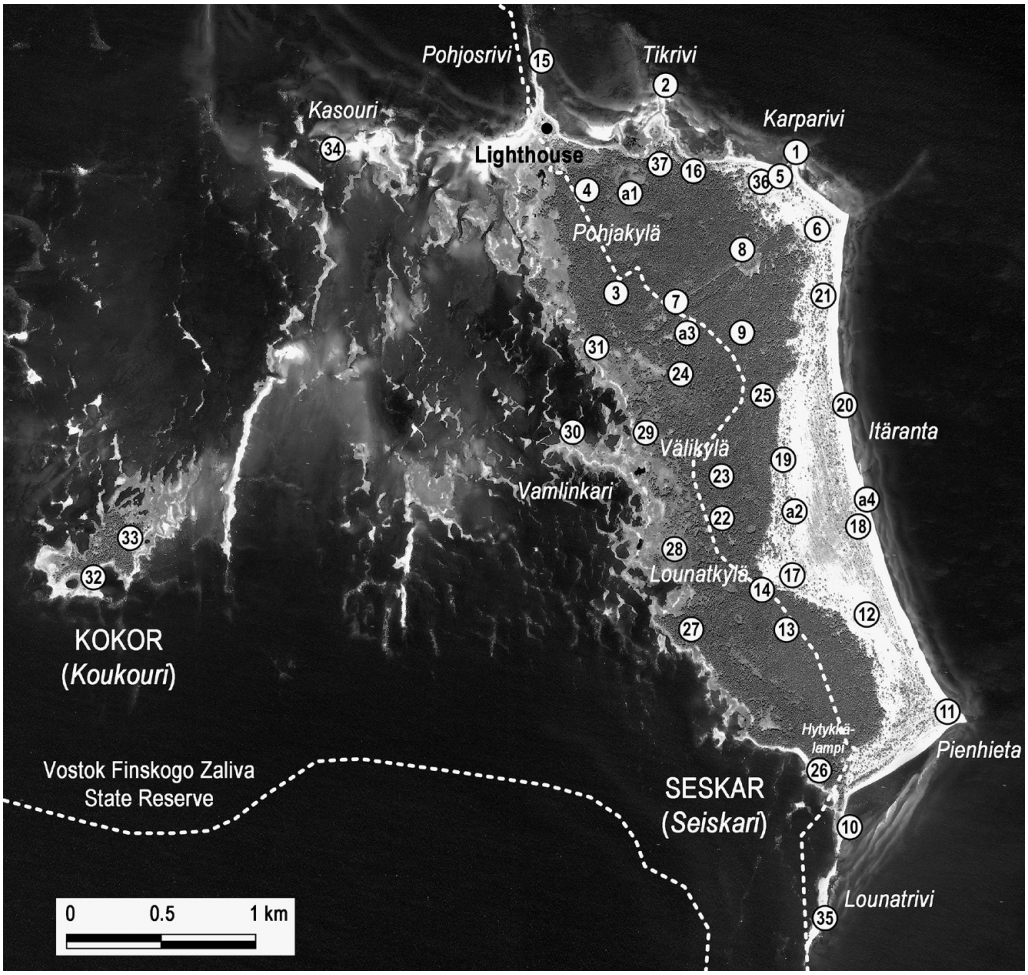


Fig. 2. The study area, Seskar Island, with location of collection sites.

Despite the peculiar location of the island and its specific ecotopes, Seskar was never thoroughly investigated by lichenologists. Only two fragmentary lichen collections are known by now. The first one was mentioned by Bertel Lemberg (Lemberg, 1933, 1935) within his studies of dune vegetation complexes in 1926. Unfortunately, Lemberg's samples are most likely missing. Another lichen collection (stored in LECB) was made by a phycologist Nataliya B. Balashova in 1993 during a large-scale botanical expedition to the islands of the Gulf of Finland. It was revised and published by Nadezhda M. Alexeeva (Alexeeva, 2005). Above mentioned studies conducted in the XX century revealed seven terricolous species (Lemberg, 1933, 1935) and 15 corticolous species (Alexeeva, 2005), only 22 widespread lichen species in total. There is no any historical information about the lichens of Kokor Island, connected to the western shore of Seskar by an extensive system of islets, shoals, sandbanks, and separate stones.

Material and Methods

Field investigations and specimen collections were made by D. E. Himelbrant (DH), A. A. Rodionova (AR), E. A. Timofeeva (ET), and A. A. Zueva (AZ) since 26 July to 3 August 2023. Altogether 41 localities were investigated (Fig. 2): 37 standard sample areas (SA) (20 × 20 m, otherwise in natural boundaries of the community), where the lichen diversity on each substrate was described as detailed as possible, and four additional plots, where only most interesting substrates and species were recorded. Geographical coordinates are given in the coordinate system WGS 1984.

Chromatography was performed by I. S. Stepanchikova (IS), DH, ET, AR, AZ, and V. A. Chernyshova according to the standard techniques of high performance thin-layer chromatography (HPTLC) using solvent systems A, B, C, and G (Orange *et al*., 2001).

DNA-analysis was performed by IS in order to confirm identification of *Myriolecis andrewii*, *M. dispersa*, *M. semipallida*, *Toniniopsis separabilis*, *Verrucaria dolosa*, *V. muralis*, and *Xylographa pallens*. DNA was extracted directly from pieces of thalli using the PhytoSorb kit (Syntol, Russia) following the manufacturer's protocol. PCR amplification and sequencing were performed for the fungal marker: nucITS rDNA with primers ITS1F (Gardes, Bruns, 1993) and ITS4 (White *et al*., 1990). PCR amplification was performed with the following program parameters: an initial denaturation at 94 °C for 5 min, followed by 5 cycles at 94 °C for 30 s, 55 °C for 30 s, and 72 °C for 1 min, then 30 cycles at 94 °C for 30 s, 52 °C for 30 s, and 72 °C for 1 min, with a final extension 72 °C for 5 min (Westberg *et al*., 2015). Amplicons were cleaned up using Cleanup S-Cap (Evrogen JSC, Moscow, Russia) and then sequenced in the Research resource center "Molecular systematics of plants and fungi" of the Komarov Botanical Institute of the Russian Academy of Science. Newly generated sequences were deposited in NCBI (GenBank). Accession numbers are provided in the list of species. For the newly generated sequences, a BLASTn search (Altschul *et al*., 1990; BLAST, 2024) against the GenBank database (NCBI, 2024) was conducted to verify the sequence identity and check for possible contamination.

The nomenclature of taxa generally follows recently published checklist for Scandinavia (Westberg *et al*., 2021) and for lichenicolous fungi (Diederich *et al*., 2018). The lichen specimens were mainly identified by AR, DH, ET, IS, and AZ, most specimens of the genus *Caloplaca* Th. Fr. s. l. were identified or confirmed by I. V. Frolov (IF), genus *Micarea* Fr. by S. V. Chesnokov (SC), and lichenicolous fungi by A. G. Tsurykau (AT), if otherwise, the names of identifiers are indicated in the species list. The specimens are deposited mainly in the herbarium of the Department of Botany, St. Petersburg State University (LECB). Few specimens (indicated in the list of species) are kept in the herbarium of Francisk Skorina Gomel State University (GSU).

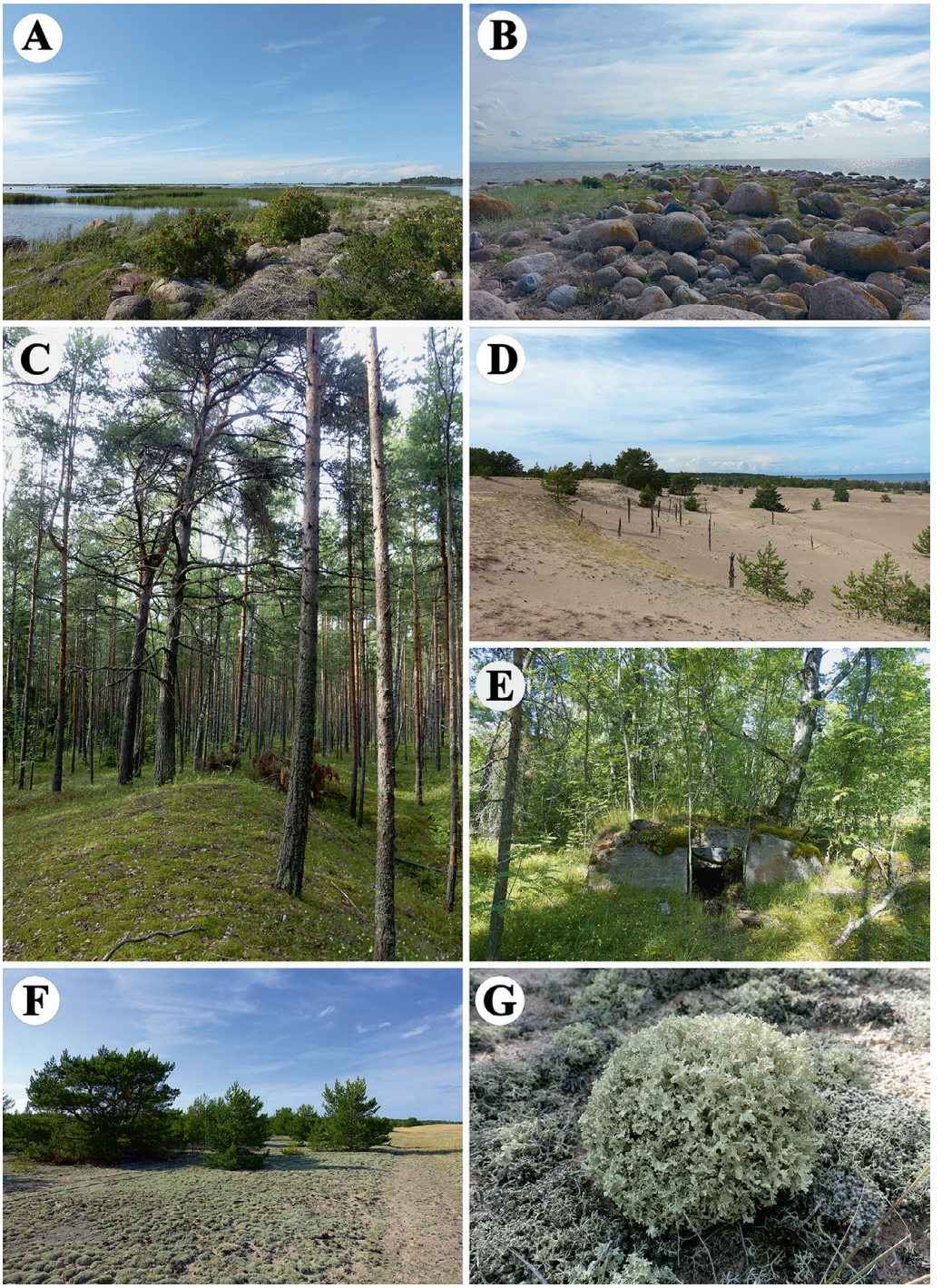
Sampling locations (Fig. 2) (the numbers of the sample areas which belong to State Nature Reserve "Vostok Finskogo Zaliva" are in bold).

Standard sample areas. Leningrad Region, Kingisepp District, Seskar Island: 1 — N part of the island, N shore, end of Cape Karparivi, 60°01′59.6″N, 28°23′09.8″E, 2 m a. s. l., granite boulders up to 2 m diam. surrounded by supralittoral community with rowans, *Leymus arenarius*, *Rumex* sp.,

Tanacetum vulgare L. etc., subject to ornitocoprophylic influence, 26 VII 2023, *Timofeeva, Zueva Seskar-1*; 2 — N part of the island, Cape Tikrivi, 60°02′11.5″N, 28°22′25.7″E, 2 m a. s. l., granite boulders up to 2 m diam. in supralittoral community formed by *Phragmites australis*, *Artemisia vulgaris*, *Leymus arenarius*, *Rumex* sp. etc., subject to ornitocoprophylic influence, 26 VII 2023, *Timofeeva, Zueva Seskar-2*; **3** — N part of the island, territory of the former Finnish village Pohjakylä, 60°01′36.1″N, 28°22′07.3″E, 6 m a. s. l., old growth birch-pine forest (pines ca. 230 years old), with grasses [mainly *Avenella flexuosa* (L.) Drejer], with mossy granite boulders, 26 VII 2023, *Himelbrant, Rodionova Seskar-3*; 4 — N part of the island, S of the lighthouse, near the road (former Majakkatie), 60°01′53.8″N, 28°21′58.1″E, 13 m a. s. l., middle-aged pine forest (pines 55 years old) with mosses and *Vaccinium myrtillus* L., with rowan undergrowth, 26 VII 2023, *Himelbrant, Rodionova Seskar-4*; 5 — N part of the island, N shore, SW from the Cape Karparivi, 60°01′55.5″N, 28°23′04.1″E, 3 m a. s. l., fragmentary moss-lichen community with scattered pines on disturbed dune, 27 VII 2023, *Timofeeva, Zueva Seskar-5*; 6 — N part of the island, E shore, 60°01′46.3″N, 28°23′16.4″E, 5 m a. s. l., open pine community with lichens and mosses on disturbed dune, 27 VII 2023, *Timofeeva, Zueva Seskar-6*; 7 — N part of the island, W end of former runway strip, 60°01′34.4″N, 28°22′27.7″E, 10 m a. s. l., birch forest with *Melampyrum sylvaticum* L. and with rowan undergrowth, 27 VII 2023, *Timofeeva, Zueva Seskar-7*; 8 — N part of the island, territory of former runway strip, 60°01′43.1″N, 28°22′50.7″E, 10 m a. s. l., dry disturbed meadow with young rowans, 27 VII 2023, *Timofeeva, Zueva Seskar-8*; 9 — central part of the island, 60°01′28.9″N, 28°22′50.0″E, 12 m a. s. l., pine forest (pines 55 years old) with *Vaccinium myrtillus*, *Melampyrum sylvaticum*, and *Calluna vulgaris* (L.) Hull, with spruce and birch undergrowth, 27 VII 2023, *Timofeeva, Zueva Seskar-9*; 10 — S part of the island, Cape Lounatrivi, 60°00′03.9″N, 28°23′21.8″E, 1 m a. s. l., granite boulders to 2 m diam. in supralittoral community dominated by *Leymus arenarius*, subject to ornitocoprophylic influence, 27 VII 2023, *Himelbrant, Rodionova Seskar-10*; 11 — S part of the island, base of Cape Pienhieta, 60°00′23.3″N, 28°23′56.1″E, 3 m a. s. l., seashore wasteland with lichens and graminoids, with sparse pines, 27 VII 2023, *Himelbrant, Rodionova Seskar-11*; 12 — S part of the island, E shore NW of Cape Pienhieta, 60°00′40.2″N, 28°23′29.1″E, 13 m a. s. l., old and resinous standing pine deadwood on open sand after the dune left (pines were 30–50 years old), 27 VII 2023, *Himelbrant, Rodionova Seskar-12*; **13** — S part of the island, 60°00′37.9″N, 28°23′01.6″E, 16 m a. s. l., pine forest (pines 50 years old) with mosses, *Vaccinium myrtillus*, *Avenella flexuosa*, *Melampyrum sylvaticum*, and *Vaccinium vitis-idaea* L., 27 VII 2023, *Himelbrant, Rodionova Seskar-13*; **14** — S part of the island, 60°00′44.8″N, 28°22′53.5″E, 8 m a. s. l., middle-aged birch-aspen stand with *Vaccinium myrtillus* and ferns in small brook valley, 27 VII 2023, *Himelbrant, Rodionova Seskar-14*; 15 — N part of the island, pier Pohjosrivi near the lighthouse, 60°02′16.1″N, 28°21′42.0″E, 2 m a. s. l., large granite stones and concrete slabs of the pier, subject to ornitocoprophylic influence, 28 VII 2023, *Himelbrant, Rodionova, Timofeeva, Zueva Seskar-15*; 16 — N part of the island, between capes Tikrivi and Karparivi, 60°01′56.7″N, 28°22′33.1″E, 8 m a. s. l., pine forest (pines ca. 150 years old) with *Maianthemum bifolium* (L.) F. W. Schmidt, *Avenella flexuosa*, and *Melampyrum sylvaticum*, 28 VII 2023, *Himelbrant, Rodionova, Timofeeva, Zueva Seskar-16*; 17 — central part of the island, E of the former Finnish village Lounatkylä, 60°00′47.2″N, 28°23′04.0″E, 10 m a. s. l., seashore dune wasteland with lichens, graminoids, and mosses, 29 VII 2023, *Rodionova, Timofeeva Seskar-17*; 18 — central part of the island, E shore (Itäranta), 60°00′55.3″N, 28°23′26.8″E, 6 m a. s. l., open seashore pine stand (pines ca. 25 years old) with lichens and mosses, 29 VII 2023, *Rodionova, Timofeeva Seskar-18*; 19 — central part of the island, 60°01′07.0″N, 28°23′01.7″E, 12 m a. s. l., open pine stand with lichens, mosses, and graminoids on dune, on the border of a pine forest, 29 VII 2023, *Rodionova, Timofeeva Seskar-19*; 20 — central part of the island, E shore (Itäranta), 60°01′16.1″N, 28°23′23.2″E, 7 m a. s. l., seashore wasteland with lichens, mosses and graminoids, 29 VII 2023, *Rodionova, Timofeeva Seskar-20*; 21 — N part of the island, E shore (Itäranta), 60°01′34.9″N, 28°23′16.6″E, 10 m a. s. l., open seashore pine community (pines ca. 30 years old) on dune with lichens and mosses, 29 VII 2023, *Rodionova, Timofeeva Seskar-21*; 22 — central part of the island, place of the former Finnish village Välikylä, 60°00′57.2″N,

28°22′40.4″E, 15 m a. s. l., anthropogenic constructions: mossy boulder fencings, granite and concrete building foundations, cellar, meadows overgrown with young small-leaved trees (aspen, birch, maple, rowan), 29 VII 2023, *Himelbrant, Zueva Seskar-22*; 23 — *ibid.*, 60°01′04.4″N, 28°22′40.5″E, 10 m a. s. l., small aspen community (aspens ca. 50 years old) with mosses and *Oxalis acetosella* L. in a lowland, 29 VII 2023, *Himelbrant, Zueva Seskar-23*; **24** — central part of the island, close to W shore, place of the former Finnish village Välikylä, 60°01′22.0″N, 28°22′27.3″E, 4 m a. s. l., wet willow thickets with *Calla palustris* L., 29 VII 2023, *Himelbrant, Zueva Seskar-24*; 25 — central part of the island, 60°01′18.1″N, 28°22′55.2″E, 16 m a. s. l., old growth pine forest (pines 180 years old) with mosses and *Melampyrum sylvaticum* near the road, 29 VII 2023, *Himelbrant, Zueva Seskar-25*; **26** — S part of the island, S shore, S of small lake Hytykkälampi, 60°00′13.7″N, 28°23′11.8″E, 2 m a. s. l., granite boulders up to 2 m diam. on the seashore, 30 VII 2023, *Timofeeva, Zueva Seskar-26*; **27** — S part of the island, E shore, 60°00′38.3″N, 28°22′29.1″E, 3 m a. s. l., seashore black alder community with *Carex* spp., 30 VII 2023, *Timofeeva, Zueva Seskar-27*; **28** — S part of the island, E shore, former Finnish village Lounatkylä, 60°00′52.1″N, 28°22′24.0″E, 6 m a. s. l., pine forest with grasses and with mossy stones, 30.07.2023, *Timofeeva, Zueva Seskar-28*; **29** — central part of the island, W shore, base of Cape Vamlinkari, 60°01′12.1″N, 28°22′15.0″E, 2 m a. s. l., scattered young oaks, birches, rowans, apple trees, and willow thickets on the seashore with huge granite boulders up to 4 m diam., 30 VII 2023, *Himelbrant, Rodionova Seskar-29*; **30** — central part of the island, W shore, tip of Cape Vamlinkari, 60°01′12.5″N, 28°21′50.0″E, 2 m a. s. l., open supralittoral community with *Artemisia vulgaris*, *Leymus arenarius*, *Rubus idaeus* L., *Rumex* sp., with rowan, juniper, *Rosa rugosa* Thunb. thickets, with granite boulders, 30 VII 2023, *Himelbrant, Rodionova Seskar-30*; **31** — N part of the island, W shore, place of the former Finnish village Pohjakylä, 60°01′26.9″N, 28°21′58.8″E, 3 m a. s. l., young seashore black alder forest (black alders ca. 30 years old) with *Carex* spp. and *Filipendula ulmaria* (L.) Maxim., 30 VII 2023, *Himelbrant, Rodionova Seskar-30*; **32** — W of Seskar, S part of the Kokor Islet, middle cape, 60°00′49.3″N, 28°19′05.4″E, 3 m a. s. l., granite boulders up to 1.5 m diam., supralittoral community with *Artemisia vulgaris*, *Leymus arenarius, Rumex* sp. etc., with rowan and juniper thickets, 31 VII 2023, *Himelbrant, Timofeeva Seskar-32*; **33** — W of Seskar, central part of the Kokor Islet, 60°00′55.9″N, 28°19′18.2″E, 6 m a. s. l., old growth pine forest with *Avenella flexuosa* and *Convallaria majalis* L., with juniper and rowan undergrowth, subject to ornitocoprophylic influence, 31 VII 2023, *Rodionova, Zueva Seskar-33*; **34** — NW of Seskar, Kasouri Islet, 60°02′01.7″N, 28°20′30.0″E, 2 m a. s. l., supralittoral community dominated by *Leymus arenarius*, with rowan and *Rosa rugosa* thickets, with granite boulders up to 1 m diam., 31 VII 2023, *Himelbrant, Rodionova, Timofeeva, Zueva Seskar-34*; 35 — S of Seskar, Lounatrivi Islet, 59°59′48.4″N, 28°23′12.7″E, 3 m a. s. l., supralittoral community dominated by *Leymus arenarius* and *Honckenya peploides* (L.) Ehrh., with *Rosa rugosa* thickets, with granite boulders up to 1.5 m diam., 1 VIII 2023, *Himelbrant, Rodionova, Timofeeva, Zueva Seskar-35*; 36 — N part of the island, N shore, SE of Cape Karparivi, 60°01′54.6″N, 28°22′56.1″E, 6 m a. s. l., territory of the former border post (brick, concrete, and wooden constructions, disturbed sandy soil), 2 VIII 2023, *Himelbrant, Timofeeva, Zueva Seskar-36*; 37 — N part of the island, S of Cape Tikrivi, 60°01′58.0″N, 28°22′21.7″E, 5 m a. s. l., wet and shady middle-aged birch forest with spruce undergrowth (spruces 36–38 years old), 3 VIII 2023, *Himelbrant, Zueva Seskar-37*.

Additional collection points. Leningrad Region, Kingisepp District, Seskar Island: a1 — N part of the island, SE of the lighthouse, 60°01′53.1″N, 28°22′11.3″E, 10 m a. s. l., birch forest with *Sphagnum* sp. and *Calla palustris*, upturned roots of birch, 26 VII 2023, *Himelbrant, Rodionova Seskar-a1*; a2 — S part of the island, E shore (Itäranta), 60°00′58.1″N, 28°23′05.2″E, 13 m a. s. l., old pine standing deadwood in wasteland graminoid-moss-lichen community on dune, 27 VII 2023, *Himelbrant, Rodionova Seskar-a2*; **a3** — central part of the island, close to W shore, place of the former Finnish village Pohjakylä, 60°01′29.0″N, 28°22′29.8″E, 15 m a. s. l., small graminoid meadow with an old apple tree, 29 VII 2023, *Himelbrant, Zueva Seskar-a3*; a4 — central part of the island, E shore, former Itäranta, 60°00′59.9″N, 28°23′30.0″E, 3 m a. s. l., seashore wasteland, old sandy car


A
B
C
D
E
F
G

track with lichen community surrounded by open pine stand (Fig. 3F), 29 VII 2023, *Rodionova, Timofeeva Seskar-a4*.

Historical locality, Seskar Island (formerly Seiskari): S — without exact locality, [60°00–02′N, 28°21–24′E], coll. *Lemberg* (Lemberg, 1933, 1935); coll. *Balashova*, det. *Alexeeva* (Alexeeva, 2005).

Results

In the annotated species list presented below the following symbols and abbreviations are used: **#** — lichenicolous fungi, **+** — non-lichenized saprobic fungi, ***** — species new to the Leningrad Region, ^{R} — species protected by the Red Data Book of Leningrad Region (Krasnaya..., 2018), ^{i} — indicator species (Vyyavlenie..., 2009), † – species known from historical data only (1926), LR — Leningrad Region, ELR — Eastern Leningrad Region, WLR — Western Leningrad Region, SPb — St. Petersburg. The species which were recorded in the limits of State Nature Reserve "Vostok Finskogo Zaliva" are marked by "VFZ" in the species list. The frequency of occurrence for the species collected in 2023 is indicated in square brackets: [R_1] "rare — single record" — the species was found once, [R] "rare" — recorded in 2–7 standard sample plots or more than in one additional plot, [O] "occasionally" — 8–14 standard sample plots, [F] "frequent" — 15–22, [C] "common" — 23–29, and [VC] "very common" — 30–37. Lichen substances are given for HPTLC-analyzed specimens. For the 22 species already reported from Seskar Island (Lemberg, 1933, 1935; Alexeeva, 2005), the references are given. For the species not previously known from SPb and LR information on their presence in Baltic and Scandinavian countries, as well as in North-West European Russia is provided.

Absconditella lignicola Vězda et Pišút — on wood of *Picea abies*; 37 [R_1].

Acarospora fuscata (Schrad.) Th. Fr. — on granite; 1, 22, 28–30, 32, 36 [R].

A. moenium (Vain.) Räsänen — on slate and concrete; 36 [R_1].

A. privigna (Ach.) A. Schneid. — on granite; 5, 32 [R].

A. veronensis A. Massal. — on granite; 1 [R_1].

Alyxoria culmigena (Libert) Ertz — on bark of *Populus tremula*; 14 [R_1].

Amandinea cacuminum (Th. Fr.) H. Mayrhofer et Sheard — on granite; 26 [R_1].

A. coniops (Wahlenb.) M. Choisy ex Scheid. et H. Mayrhofer — on granite; 1, 10, 15, 22, 26, 32, 35 [R].

A. punctata (Hoffm.) Coppins et Scheid. — on bark of *Alnus glutinosa*, *Betula* sp., *Juniperus communis*, *Padus avium*, *Quercus robur*, *Rosa* sp., *Salix* sp., *Sorbus aucuparia*; 27–29, 32 [R].

Arthonia didyma Körb. — on bark of *Populus tremula*; 23 [R_1].

A. fusca (A. Massal.) Hepp — on concrete; 36 [R_1].

A. radiata (Pers.) Ach. — on bark of *Populus tremula*, *Sorbus aucuparia*; 4, 7, 22, 23, 27 [R].

Fig. 3. The lichens of Seskar Island and their habitats. A, B — seashore spits with granite boulders; C — pine forest with separate old trees on dune; D — dune complex with open pine community and standing deadwood (SA 12, habitat of *Calicium tigillare*); E — ruins of former Finnish village Välikylä; F — seashore wasteland with lichen community surrounded by open pine stand (SA a4, habitat of *Flavocetraria nivalis*); G — *F. nivalis* (SA a4).

Arthonia ruana A. Massal. — on bark of *Populus tremula*, *Sorbus aucuparia*; 22, 23 [R].

#Arthrorhaphis aeruginosa R. Sant. et Tønsberg — on thalli of *Cladonia deformis*, *C. botrytes* and *C. subulata* on pine deadwood and sandy soil; 5, 17 [R]; LECB (*det. DH, AR*), GSU (*det. AT*).

Aspicilia cinerea (L.) Körb. — on granite; 1, 5, 22, 26, 28–30, 32, 35 [O].

Athallia holocarpa (Hoffm.) Arup et al. — on slate and concrete; 36 [R_1].

A. pyracea (Ach.) Arup et al. — on bark of *Alnus glutinosa*, *Populus tremula*, *Rosa* sp.; 14, 31, 35 [R].

A. scopularis (Nyl.) Arup et al. — on granite, concrete; 1, 2, 10, 15, 26, 32, 35 [R].

#Athelia arachnoidea (Berk.) Jülich — on thalli of crustose lichens on bark of *Picea abies*; 37 [R_1]; LECB (*det. DH, AZ*).

Bacidina neosquamulosa (Aptroot et Herk) S. Ekman — on iron; 22 [R_1].

Bellemerea cinereorufescens (Ach.) Clauzade et Cl. Roux — on granite; 5 [R_1].

Biatora efflorescens (Hedl.) Räsänen — on bark of *Alnus glutinosa*, *Betula* sp., *Populus tremula*, *Quercus robur*, *Sorbus aucuparia*; 3, 4, 22, 23, 29, 31, 37 [R].

B. sphaeroidiza (Vain.) Printzen et Holien — on bark of *Populus tremula*; 37 [R_1].

Bilimbia sabuletorum (Schreb.) Arnold — on slate, mosses; 22, 36 [R].

#Briancoppinsia cytospora (Vouaux) Diederich et al. — on thallus of *Cladonia coniocraea* on bark of *Betula* sp.; 7 [R_1]; LECB (*det. DH, IS*).

Bryoria fuscescens (Gyeln.) Brodo et D. Hawksw. — on bark of *Juniperus communis*, *Pinus sylvestris*, *Quercus robur*, *Salix* sp., *Sorbus aucuparia*, pine deadwood and worked timber; 12, 16, 24, 28, 29, 36 [R].

B. simplicior (Vain.) Brodo et D. Hawksw. — on wood of *Pinus sylvestris*; a2 [R_1].

Buellia disciformis (Fr.) Mudd — on bark of *Alnus glutinosa*; 27 [R_1].

B. griseovirens (Turner et Borrer ex Sm.) Almb. — on bark of *Acer platanoides*, *Betula* sp., *Juniperus communis*, *Sorbus aucuparia*; 3, 4, 14, 22, 33 [R].

B. schaereri De Not. — on bark of *Juniperus communis*; 28 [R_1].

Calicium glaucellum Ach. — on wood of *Pinus sylvestris*; 16, 36 [R].

R, i C. tigillare (Ach.) Pers. — on wood of *Pinus sylvestris*; 12 (Fig. 3D) [R_1].

***Caloplaca alcarum** auct — on granite; 1, 10, 26, 35 [R]. New for North-Western European Russia. The nearest known location in Russia is in Murmansk Region (Zhdanov, 2014; Frolov, Konoreva, 2016). Distribution in Fennoscandia and Baltic countries: not reported.

Caloplaca alcarum in its original sense (Poelt, 1954) was synonymized under *Athallia holocarpa* by Vondrák *et al.* (2016). Here we use this name following some other authors (Hansen *et al.*, 1987; Søchting *et al.*, 2008; Gaya, 2009; Frolov, Konoreva, 2016) who employed it for probably undescribed species closely related to *A. scopularis*. It is characterized by yellow almost subglobose thalli with strongly reduced lobes.

C. chlorina (Flot.) H. Olivier — on granite; 35 [R_1].

Candelariella aurella (Hoffm.) Zahlbr. — on granite, concrete; 10, 15, 29, 36 [R].

C. coralliza (Nyl.) H. Magn. — on granite; 1, 30, 32, 35 [R].

C. vitellina (Hoffm.) Müll. Arg. — on bark of *Quercus robur*, *Sorbus aucuparia*, granite, slate, concrete; 1, 5, 22, 26, 28–30, 32, 36 [O].

Carbonea vorticosa (Flörke) Hertel — on granite; 32 [R_1].

Catillaria chalybeia (Borrer) A. Massal. — on granite; 26 [R_1].

Cetraria aculeata (Schreb.) Fr. — on wood of *Pinus sylvestris*, soil; 5, 6, 11, 17–21, 36 [O].

C. ericetorum Opiz subsp. **ericetorum** — on sandy soil; 11, 18, 20 [R].

C. islandica (L.) Ach. — on wood of *Pinus sylvestris*, soil; 5, 6, 11, 18, 20, 21, 36 [R].

C. muricata (Ach.) Eckfeldt — on sandy soil; 11 [R_1].

C. sepincola (Ehrh.) Ach. — on bark of *Betula* sp., *Juniperus communis*, *Pinus sylvestris*, wood of *Pinus sylvestris*; 3, 11, 12, 21, 24, 29, 30 [R].

Chaenotheca chrysocephala (Turner ex Ach.) Th. Fr. — on bark of *Betula* sp., *Pinus sylvestris*; 3, 7 [R].

C. ferruginea (Turner ex Sm.) Mig. — on bark of *Betula* sp., *Juniperus communis*, *Pinus sylvestris*; 3, 4, 7, 9, 16, 25, 33 [R].

[i]**C. stemonea** (Ach.) Müll. Arg. — on bark of *Betula* sp., *Pinus sylvestris*; 3 [R_1].

C. trichialis (Ach.) Th. Fr. — on bark and wood of *Pinus sylvestris*; 3, 4, 33 [R].

C. xyloxena Nádv. — on wood of *Pinus sylvestris*; 36 [R_1].

[i]**+Chaenothecopsis nigra** Tibell — on upturned roots; a1 [R_1].

(#)C. pusilla (Ach.) A. F. W. Schmidt — on wood of *Pinus sylvestris*, on thallus of *Hypocenomyce scalaris* on bark of *Pinus sylvestris*; 3, 7, 8 [R]; LECB (*det. IS*).

Circinaria gibbosa (Ach.) A. Nordin et al. — on granite; 1 [R_1].

Cladonia amaurocraea (Flörke) Schaer. — on sandy soil; 5 [R_1].

C. arbuscula (Wallr.) Flot. — on bark and wood of *Pinus sylvestris*, sandy soil; 5, 6, 8, 11, 17–21, 36 [O].

C. bacilliformis (Nyl.) Sarnth. — on wood of *Pinus sylvestris*; 6, 36 [R].

C. borealis S. Stenroos — on sandy soil; 18 [R_1].

C. botrytes (K. G. Hagen) Willd. — on wood of *Pinus sylvestris*, sandy soil; 5, 8 [R].

C. carneola (Fr.) Fr. — on sandy soil; 5, 6, 8, 19 [R].

C. cenotea (Ach.) Schaer. — on bark of *Betula* sp., *Pinus sylvestris*, wood of *Pinus sylvestris*; 8, 16, 25 [R].

C. cervicornis (Ach.) Flot. — on wood of *Pinus sylvestris*, sandy soil; 5, 6, 11, 17, 21 [R].

C. chlorophaea (Flörke ex Sommerf.) Spreng. — on bark of *Betula* sp., *Juniperus communis*, wood of *Pinus sylvestris*, soil; 6–8, 20, 28, 33, 34 [R]. Thalli contain fumarprotocetraric acid.

C. coniocraea (Flörke) Spreng. — on bark of *Betula* sp., *Juniperus communis*, *Pinus sylvestris*, *Populus tremula*, *Ribes alpinum*, wood of *Juniperus communis* and *Pinus sylvestris*, sandy soil and mosses; 3, 4, 7–9, 13, 14, 16, 17, 22, 23, 25, 28, 33, 36, 37 [F].

C. cornuta (L.) Hoffm. subsp. **cornuta** — on bark and wood of *Pinus sylvestris*, sandy soil; 6, 8, 16–19, 21, 36 [O].

C. crispata (Ach.) Flot. var. **crispata** — on soil; 8, 11, 17, 36.

var. **cetrariiformis** (Delise) Vain. — on soil; 17. [R].

C. deformis (L.) Hoffm. — on wood of *Pinus sylvestris*, soil; 5, 6, 8, 18, 21, 36 [R].

C. digitata (L.) Hoffm. — on bark of *Pinus sylvestris*; 9, 16 [R].

C. fimbriata (L.) Fr. — on bark of *Betula* sp., *Juniperus communis*, *Malus domestica*, *Pinus sylvestris*, *Populus tremula*, wood of *Pinus sylvestris*, sandy soil and mosses; 3, 6–9, 16, 22, 25, 28, 33, 34, 36, a3 [O].

C. floerkeana (Fr.) Flörke — on wood of *Pinus sylvestris*, sandy soil; 5, 11, 17–21, 36 [O].

C. gracilis (L.) Willd. subsp. **gracilis** — on sandy soil; 8, 17–19, 21.

subsp. **turbinata** (Ach.) Ahti — on sandy soil and pine deadwood; 8, 17–21, 36. [R].

C. grayi G. Merr. ex Sandst. — on bark of *Betula* sp., mosses; 9, 22 [R]. Thalli contain grayanic and fumarprotocetraric acids.

Cladonia macilenta Hoffm. — on wood of *Pinus sylvestris*, sandy soil; 5, 6, 8, 12, 20 [R].

C. macroceras (Delise) Hav. — on sandy soil; 21 [R_1].

C. mitis Sandst. — on wood of *Pinus sylvestris*, sandy soil; 5, 6, 8, 11, 18–21 [O].

C. novochlorophaea (Sipman) Brodo et Ahti — on wood of *Pinus sylvestris*, sandy soil; 5, 6 [R]. Thalli contain sekikaic and homosekikaic acids.

C. ochrochlora Flörke — on bark of *Betula* sp., wood of *Pinus sylvestris*; 8, 16 [R].

C. phyllophora Hoffm. — on wood of *Pinus sylvestris*, soil; 5, 6, 8, 11, 17, 18, 21, 36 [O].

C. pleurota (Flörke) Schaer. — on sandy soil; 11, 18, 19 [R].

C. pyxidata (L.) Hoffm. — on sandy soil; 18, 20 [R].

C. ramulosa (With.) J. R. Laundon — on bark of *Juniperus communis*; 28 [R_1].

C. rangiferina (L.) F. H. Wigg. — on bark and wood of *Pinus sylvestris*, soil; 5, 6, 8, 11, 17–21, 36 [O].

C. rei Schaer. — on sandy soil; 6, 8, 11, 18, 20, 22, 34 [R].

C. stellaris (Opiz) Pouzar et Vězda — on sandy soil; 6, 19, 21 [R].

C. subulata (L.) F. H. Wigg. — on sandy soil; 6, 17, 19, 22, 36 [R].

C. sulphurina (Michx.) Fr. — on wood of *Pinus sylvestris* and soil; 8, 11, 17, 19, 36 [R].

C. uncialis (L.) F. H. Wigg. subsp. **uncialis** — on sandy soil; 5, 6, 11, 17, 18, 21.

subsp. **biuncialis** (Hoffm.) M. Choisy — on sandy soil; 8, 18. [R].

C. verticillata (Hoffm.) Schaer. — on soil; 5, 6, 8, 11, 17, 19, 21, 36 [O].

Clauzadea monticola (Schaer.) Hafellner et Bellem. — on concrete; 22 [R_1].

Cliostomum griffithii (Sm.) Coppins — on bark of *Alnus glutinosa*; 27 [R_1].

#Clypeococcum hypocenomycis D. Hawksw. — on thalli of *Hypocenomyce scalaris* on bark and wood of *Pinus sylvestris*; 3, 8, 12, 13, 16, 25, 33 [R]; LECB (*det. DH, AR, IS, AZ*).

Coenogonium pineti (Ach.) Lücking et Lumbsch — on bark of *Betula* sp., *Picea abies*, *Pinus sylvestris*, on wood of *Picea abies*; 4, 8, 13, 16, 25, 37 [R].

+*Cryptodiscus muriformis Fern.-Brime et al. — on wood of *Pinus sylvestris*; 3 [R_1]. New to North-Western European Russia. Distribution in Russia: Nizhny Novgorod Region (Urbanavichus, Urbanavichene, 2023). Distribution in Fennoscandia and Baltic countries: Sweden (Fernández-Brime *et al*., 2018).

Recently described species, which resembles *Cryptodiscus foveolaris* (Rehm) Rehm and *C. tabularum*, but distinguished by the muriform ascospores unique for the genus (Fernández-Brime *et al*., 2018).

+*C. pini (Romell) Baloch et al. — on wood of *Pinus sylvestris*; 9 [R_1]. New to North-Western European Russia. Nearest known locality in European Russia: Kostroma Region (Urbanavichene, Urbanavichus, 2023). Distribution in Fennoscandia and Baltic countries: Finland (Purhonen *et al*., 2020), Sweden (Baloch *et al*., 2009).

Characterized by dark brown ascomata, becoming erumpent when mature, pale brownish disc of ascomata, and 1-septate ascospores (Baloch *et al*., 2009).

+*C. tabularum Kirschst. — on wood of *Picea abies*; 37 [R_1]. New to North-Western European Russia. Nearest known locality in European Russia: Kostroma Region (Urbanavichene, Urbanavichus, 2023). Distribution in Fennoscandia and Baltic countries: Sweden (Baloch *et al*., 2009).

Distinguished from other species of the genus by roundish ascomata with distinctly yellowish-orange disc, and 3(–7) septate ascospores (Baloch *et al*., 2009).

R, i Diarthonis spadicea (Leight.) Frisch et al. — on bark of *Betula* sp.; 37 [R_1].

Evernia mesomorpha Nyl. — on wood of *Pinus sylvestris*; 12 [R_1].

E. prunastri (L.) Ach. — on bark of *Acer platanoides*, *Betula* sp., *Juniperus communis*, *Malus domestica*, *Pinus sylvestris*, *Quercus robur*, *Salix* sp., *Sorbus aucuparia*, worked timber; 13, 22, 24, 28, 29, 36, a3 [R].

[R]**Flavocetraria nivalis** (L.) Kärnefelt et A. Thell (Fig. 3G) — on sandy soil; a4 (Fig. 3F) [R_1].

Flavoplaca citrina (Hoffm.) Arup et al. — on concrete; 29 [R_1].

F. flavocitrina (Nyl.) Arup et al. — on concrete; 29 [R_1].

Fuscidea arboricola Coppins et Tønsberg — on bark of *Betula* sp.; 3 [R_1]. Thallus contains fumarprotocetraric acid.

F. pusilla Tønsberg — on bark of *Alnus glutinosa*, *Betula* sp., *Juniperus communis*, *Malus domestica*, *Picea abies*, *Pinus sylvestris*, *Sorbus aucuparia*, on wood of *Pinus sylvestris*; 3, 7, 9, 13, 14, 16, 21–23, 25, 27–31, 33, 37, a3 [F].

Graphis scripta (L.) Ach. — on bark of *Sorbus aucuparia*; 3, 4 [R].

Gyalolechia flavorubescens (Huds.) Søchting et al. — on bark of *Populus tremula*; 14 [R_1].

Haematomma ochroleucum (Neck.) J. R. Laundon — on granite; 22 [R_1]. Thalli contain atranorin, zeorin, usnic and porphyrilic acids.

[i]**Hertelidea botryosa** (Fr.) Printzen et Kantvilas — on wood of *Pinus sylvestris*; 6 [R_1].

#Homostegia piggotii (Berk. et Broome) P. Karst. — on thalli of *Parmelia saxatilis* on granite boulders; 22, 30 [R]; LECB (*det. DH, AR, AZ*).

Hydropunctaria maura (Wahlenb.) Keller et al. — on granite; 1, 26, 35 [R].

Hypocenomyce scalaris (Ach.) M. Choisy — on bark of *Betula* sp., *Pinus sylvestris*, wood of *Pinus sylvestris*; 3, 4, 6–9, 12–14, 16, 25, 33, 36 [O].

Hypogymnia farinacea Zopf — on bark and wood of *Pinus sylvestris*; 11, 12 [R].

H. physodes (L.) Nyl. — on bark of *Acer platanoides*, *Alnus glutinosa*, *Betula* sp., *Juniperus communis*, *Malus domestica*, *Padus avium*, *Picea abies*, *Pinus sylvestris*, *Populus tremula*, *Quercus robur*, *Ribes alpinum*, *Rosa* sp., *Salix* sp., *Sorbus aucuparia*, wood of *Juniperus communis* and *Pinus sylvestris*, worked timber; 3, 4, 6–9, 11–14, 16, 18, 19, 21–25, 27–30, 32–34, 36, 37, a2, a3 [C].

H. tubulosa (Schaer.) Hav. — on bark of *Betula* sp., *Juniperus communis*, *Malus domestica*, *Picea abies*, *Pinus sylvestris*, *Quercus robur*, *Rosa* sp., *Salix* sp., *Sorbus aucuparia*, wood of *Pinus sylvestris*; 9, 11, 12, 16, 21, 24, 29, 30, 33, 36, a3 [O].

Imshaugia aleurites (Ach.) S. L. F. Meyer — on wood of *Pinus sylvestris*; 12 [R_1].

#Intralichen christiansenii (D. Hawksw.) D. Hawksw. et M. S. Cole — on thallus of *Athallia scopularis* on granite boulder; 26 [R_1]; LECB (*det. IS*).

Lambiella furvella (Nyl. ex Mudd) M. Westb. et Resl — on thalli of crustose lichens on granite (lichenicolous lichen); 36 [R_1].

L. insularis (Nyl.) T. Sprib. — on thalli of *Lecanora bicincta* and *L. rupicola* on granite boulders (lichenicolous lichen); 30 [R_1].

Lecania cyrtella (Ach.) Th. Fr. — on bark of *Alnus glutinosa*, *Betula* sp., *Juniperus communis*, *Malus domestica*, *Populus tremula*, *Salix* sp., *Sorbus aucuparia*; 7, 14, 22, 23, 28–31, a3 [O].

L. naegelii (Hepp) Diederich et van den Boom — on bark of *Acer platanoides*, *Alnus glutinosa*, *Betula* sp., *Juniperus communis*, *Padus avium*, *Populus tremula*, *Rosa* sp., *Salix* sp., *Sorbus aucuparia*; 3, 4, 7, 14, 22–24, 28, 29, 31–33 [O].

L. sylvestris (Arnold) Arnold — on concrete; 36 [R_1].

Lecanora aitema (Ach.) Hepp — on bark of *Rosa* sp. and on wood of *Pinus sylvestris*; 8, 12 [R].

Lecanora albellula (Nyl.) Th. Fr. — on bark of *Alnus glutinosa*, *Betula* sp., on worked timber; 3, 7, 31, 36 [R].

L. allophana Nyl. — on bark of *Populus tremula*; 14, 23 [R].

L. argentata (Ach.) Malme — on bark of *Salix* sp.; 24 [R_1].

L. bicincta Ramond — on granite boulder; 30 [R_1].

L. cadubriae (A. Massal.) Hedl. — on bark of *Betula* sp., bark and wood of *Pinus sylvestris*; 3, 8, 12, 13, 25 [R].

L. carpinea (L.) Vain. — on bark of *Acer platanoides*, *Alnus glutinosa*, *Betula* sp., *Juniperus communis*, *Malus domestica*, *Padus avium*, *Pinus sylvestris*, *Populus tremula*, *Quercus robur*, *Rosa* sp., *Salix* sp., *Sorbus aucuparia*, wood of *Juniperus communis*; 3, 4, 7, 8, 14, 16, 22–24, 26–34 [F].

L. cenisia Ach. — on granite; 28, 36 [R].

L. chlarotera Nyl. — on bark of *Acer platanoides*, *Alnus glutinosa*, *Betula* sp., *Juniperus communis*, *Malus domestica*, *Pinus sylvestris*, *Populus tremula*, *Quercus robur*, *Rosa* sp., *Sorbus aucuparia*, on wood of *Juniperus communis*; 3, 13, 14, 22–30, 34, a3 [O].

L. circumborealis Brodo et Vitik. — on bark of *Pinus sylvestris*, *Rosa* sp.; 8, 19 [R].

L. expallens Ach. — on bark of *Alnus glutinosa*; 27 [R_1]. Thalli contain zeorin, usnic acid, arthothelin, and expallens-unknown.

L. helicopis (Wahlenb.) Ach. — on granite; 26, 35 [R].

L. hypoptoides (Nyl.) Nyl. — on bark of *Picea abies*; 9 [R_1].

L. intricata (Ach.) Ach. — on worked timber and granite; 5, 22, 28, 30, 32, 36 [R].

L. polytropa (Ehrh. ex Hoffm.) Rabenh. — on granite; 5, 22, 28, 29, 30, 32 [R].

L. pulicaris (Pers.) Ach. — on bark of *Alnus glutinosa*, *Betula* sp., *Juniperus communis*, *Malus domestica*, *Padus avium*, *Pinus sylvestris*, *Salix* sp., *Sorbus aucuparia*, on wood of *Pinus sylvestris*; 3, 4, 6–9, 11, 14, 16, 19, 21, 22, 24, 27–29, 31–34, 36 [F].

L. rupicola (L.) Zahlbr. — on granite; 5, 22, 29, 30 [R].

L. saligna (Schrad.) Zahlbr. — on bark of *Alnus glutinosa*; 31 [R_1].

L. subintricata (Nyl.) Th. Fr. — on bark of *Alnus glutinosa*, *Pinus sylvestris*, *Rosa* sp., on wood of *Pinus sylvestris*; 8, 12, 27 [R].

L. symmicta (Ach.) Ach. — on bark of *Acer platanoides*, *Alnus glutinosa*, *Betula* sp., *Juniperus communis*, *Malus domestica*, *Padus avium*, *Pinus sylvestris*, *Populus tremula*, *Quercus robur*, *Rosa* sp., *Salix* sp., *Sorbus aucuparia*, on wood of *Juniperus communis* and *Pinus sylvestris*; 3, 7, 8, 13, 14, 22–24, 27–32, 34, 36 [F].

L. umbrina (Ach.) A. Massal. — on granite boulders and on bark of *Acer platanoides*, *Alnus glutinosa*, *Juniperus communis*, *Padus avium*, *Quercus robur*, *Rosa* sp., *Salix* sp., *Sorbus aucuparia*; 10, 15, 22, 24, 27–32, 34, 35 [O].

L. varia (Hoffm.) Ach. — on bark of *Alnus glutinosa*, *Betula* sp., *Juniperus communis*, *Padus avium*, *Pinus sylvestris*, *Rosa* sp., on wood of *Juniperus communis* and *Pinus sylvestris*; 11, 12, 24, 28–31 [R].

Lecidea lapicida (Ach.) Ach. var. **lapicida** — on granite; 22.

var. **pantherina** Ach. — on granite; 5, 32, 36. [R].

L. nylanderi (Anzi) Th. Fr. — on bark of *Betula* sp., *Juniperus communis*, *Picea abies*, *Pinus sylvestris*, *Populus tremula*, *Sorbus aucuparia*, on wood of *Pinus sylvestris*; 3, 4, 8, 9, 13, 16, 22, 23, 25, 28, 33, 36, 37 [O].

Lecidella elaeochroma (Ach.) M. Choisy — on bark of *Acer platanoides*, *Alnus glutinosa*, *Malus domestica*, *Populus tremula*, *Quercus robur*, *Rosa* sp., *Salix* sp., *Sorbus aucuparia*; 3, 7, 14, 22–24, 27–32, 34, 35 [O].

L. euphorea (Flörke) Hertel — on bark of *Pinus sylvestris*, *Populus tremula*; 14, 22, 23, 28 [R].

L. flavosorediata (Vězda) Hertel et Leuckert — on bark of *Quercus robur*; 29 [R_1]. Thallus contains arthothelin and granulosin.

L. stigmatea (Ach.) Hertel et Leuckert — on slate and concrete; 36 [R_1].

***L. subviridis** Tønsberg — on bark of *Populus tremula*; 23 [R_1]. Thallus contains atranorin, arthothelin, and thiophanic acid. New to the Leningrad Region, known from St. Petersburg (Himelbrant *et al*., 2023).

Lepraria elobata Tønsberg — on bark of *Alnus glutinosa*, *Betula* sp., *Picea abies*, *Pinus sylvestris*, *Populus tremula*, *Sorbus aucuparia*, granite; 3, 4, 16, 22, 23, 25, 27, 37 [O]. Thalli contain atranorin, zeorin, and stictic acid complex.

L. incana (L.) Ach. — on bark of *Alnus glutinosa*, *Betula* sp., *Picea abies*, *Pinus sylvestris*, *Populus tremula*, *Quercus robur*, wood of *Picea abies*, mosses; 3, 4, 7–9, 13, 14, 16, 22, 25, 27, 29, 33, 37 [O]. Thalli contain atranorin, zeorin, and divaricatic acid.

L. jackii Tønsberg — on wood of *Pinus sylvestris*, upturned roots; 8, 9 [R]. Thalli contain atranorin, roccellic/angardianic and jackinic/rangiformic acids.

L. finkii (B. de Lesd.) R. C. Harris — on bark of *Picea abies*, *Pinus sylvestris*, *Populus tremula*, concrete; 14, 22, 33, 37 [R].

L. membranacea (Dicks.) Vain. — on bark of *Betula* sp.; 7 [R_1].

L. neglecta (Nyl.) Lettau — on granite; 28, 29 [R].

Leptorhaphis atomaria (Ach.) Szatala — on bark of *Populus tremula*; 14, 22, 23 [R].

+L. epidermidis (Ach.) Th. Fr. — on bark of *Betula* sp.; 37 [R_1].

#Lichenoconium lecanorae (Jaap) D. Hawksw. — on thalli and apothecia of *Lecanora carpinea* and *Melanohalea olivacea* on bark of *Quercus robur* and *Malus domestica*; 29, a3 [R]; LECB (*det. IS*), GSU (*det. AT*).

#Lichenoconium xanthoriae M. S. Christ. — on apothecia of *Polycauliona polycarpa* on bark of *Juniperus communis*; 28 [R_1]; LECB (*det. IS*).

[R]Melanelia stygia (L.) Essl. — on granite; 5 [R_1].

Melanelixia fuliginosa (Fr. ex Duby) O. Blanco et al. — on granite; 22, 29, 30, 32 [R].

M. glabratula (Lamy) Sandler et Arup — on bark of *Alnus glutinosa*, *Populus tremula*, *Rosa* sp., *Sorbus aucuparia*; 16, 23, 27, 28 [R].

M. subaurifera (Nyl.) O. Blanco et al. — on bark of *Alnus glutinosa*, *Betula* sp., *Juniperus communis*, *Malus domestica*, *Padus avium*, *Picea abies*, *Populus tremula*, *Quercus robur*, *Rosa* sp., *Salix* sp., *Sorbus aucuparia*; 3, 7, 22–24, 27–31, 33, 37, a3 [O].

Melanohalea exasperata (De Not.) O. Blanco et al. — on bark of *Betula* sp. and *Malus domestica*; 26, 29 [R].

M. exasperatula (Nyl.) O. Blanco et al. — on bark of *Betula* sp., *Juniperus communis*, *Malus domestica*, *Picea abies*, *Pinus sylvestris*, *Populus tremula*, *Quercus robur*, *Rosa* sp., *Salix* sp., *Sorbus aucuparia*; 3, 4, 7, 9, 14, 24, 26, 29, 30, 32–34, 37, a3 [O].

M. olivacea (L.) O. Blanco et al. — on bark of *Acer platanoides*, *Alnus glutinosa*, *Betula* sp., *Juniperus communis*, *Malus domestica*, *Pinus sylvestris*, *Rosa* sp., *Salix* sp.; 3, 11, 22, 24, 26, 28–31, 34, a3 [O].

Micarea botryoides (Nyl.) Coppins — on upturned roots; a1 [R_1]. No lichen substances detected by TLC.

M. byssacea (Th. Fr.) Czarnota et al. — on bark of *Pinus sylvestris*; 9 [R_1]. Thallus contains metoxymicareic acid.

M. denigrata (Fr.) Hedl. — on bark and wood of *Pinus sylvestris*; 5, 8, 36 [R].

Micarea misella (Nyl.) Hedl. — on wood of *Picea abies* and *Pinus sylvestris*; 4, 7, 9, 16, 36, 37 [R].

M. prasina Fr. — on wood of *Picea abies* and *Pinus sylvestris*; 7, 8, 37 [R]. Thalli contain micareic acid.

M. pusilla Launis et al. — on wood of *Picea abies* and *Pinus sylvestris*; 7, 37 [R].

M. soralifera Guzow-Krzem. et al. — on wood of *Picea abies*; 37 [R_1]. Thallus contains micareic acid.

Montanelia sorediata (Ach.) Divakar et al. — on granite; 29 [R_1].

+Mycocalicium subtile (Pers.) Szatala — on standing deadwood of *Pinus sylvestris*; 4 [R_1].

Myriolecis andrewii (B. de Lesd.) Śliwa et al. — on granite; 1, 2 (GenBank accession number: PP430595), 26 [R].

M. dispersa (Pers.) Śliwa et al. — on concrete, slate, and granite; 15, 29 (GenBank accession number: PP430593), 36 [R].

M. hagenii (Ach.) Śliwa et al. — on bark of *Alnus glutinosa*, *Juniperus communis*, *Malus domestica*, *Padus avium*, *Populus tremula*, *Rosa* sp.; 8, 23, 28, 29, 31 [R].

M. salina (H. Magn.) Śliwa et al. — on granite; 26 [R_1].

M. semipallida (H.Magn.) Śliwa et al. — on slate and concrete; 36 (GenBank accession number: PP430596) [R_1].

Naetrocymbe punctiformis (Pers.) R. C. Harris — on bark of *Alnus glutinosa*, *Quercus robur*, *Salix* sp., *Sorbus aucuparia*; 8, 22, 24, 27, 29–32 [O].

+Naevia punctiformis (Ach.) A. Massal. — on bark of *Acer platanoides*, *Alnus glutinosa*, *Betula* sp., *Quercus robur*, *Sorbus aucuparia*; 3, 7, 8, 22, 27, 29–33 [O].

#Niesslia keissleri Zhurb. — on thallus of *Cladonia deformis* on sandy soil; 5 [R_1]; GSU (*det. AT*). New to WLR, previously known from ELR (Himelbrant *et al.*, 2017; as *Echinothecium cladoniae* Keissl., nom. nud.).

Ochrolechia arborea (Kreyer) Almb. — on bark of *Juniperus communis*; 28 [R_1]. Thallus contains gyrophoric and lecanoric acids, and lichexanthone.

Pachyphiale fagicola (Hepp) Zwackh — on bark of *Betula* sp. and *Quercus robur*; 7, 29 [R].

Palicella filamentosa (Stirt.) Rodr. Flakus et Printzen — on wood of *Pinus sylvestris*; 12 [R_1].

Parmelia saxatilis (L.) Ach. — on bark of *Betula* sp., *Pinus sylvestris*, *Quercus robur*, on granite and mosses; 1, 22, 26, 28–30, 32 [R]. Thalli contain atranorin, salazinic and stictic acids.

P. sulcata Taylor — on bark of *Acer platanoides*, *Alnus glutinosa*, *Betula* sp., *Juniperus communis*, *Malus domestica*, *Padus avium*, *Picea abies*, *Pinus sylvestris*, *Populus tremula*, *Quercus robur*, *Rosa* sp., *Salix* sp., *Sorbus aucuparia*, on wood of *Juniperus communis* and *Pinus sylvestris*, on granite; 3, 4, 6–9, 11, 14, 16, 19, 22–24, 26–34, 36, 37, a3 [C].

Parmeliopsis ambigua (Wulfen) Nyl. — on bark of *Betula* sp., *Juniperus communis*, *Malus domestica*, *Pinus sylvestris*, *Populus tremula*, *Sorbus aucuparia*, on wood of *Juniperus communis* and *Pinus sylvestris*; 3–9, 12–14, 16, 22, 23, 25, 28, 33, 36, a3 [F].

P. hyperopta (Ach.) Arnold — on bark of *Betula* sp. and on wood of *Pinus sylvestris*; 9, 12, a2 [R].

Peltigera canina (L.) Willd. — on soil; 30, 36 [R].

P. didactyla (With.) J. R. Laundon — on soil; 36 [R_1].

P. extenuata (Nyl. ex Vain.) Lojka — on soil; 36 [R_1].

P. praetextata (Flörke ex Sommerf.) Zopf — on mosses; 22, 23 [R].

P. rufescens (Weiss) Humb. — on soil; 36 [R_1].

Phaeophyscia ciliata (Hoffm.) Moberg — on bark of *Populus tremula*; 14 [R_1].

P. nigricans (Flörke) Moberg — on slate and concrete; 36 [R_1].

P. orbicularis (Neck.) Moberg — on bark of *Populus tremula*, *Quercus robur*, on slate and concrete; 14, 29, 36 [R].

P. sciastra (Ach.) Moberg — on concrete; 29, 36 [R].

Phlyctis argena (Spreng.) Flot. — on bark of *Betula* sp., *Populus tremula*, *Quercus robur*, *Salix* sp., *Sorbus aucuparia*, on wood of *Pinus sylvestris* and *Sorbus aucuparia*; 4, 14, 22–24, 29, 33, 37 [O].

Physcia adscendens H. Olivier — on bark of *Alnus glutinosa*, *Malus domestica*, *Populus tremula*, *Quercus robur*, *Rosa* sp., *Salix* sp., *Sorbus aucuparia*, on wood of *Sorbus aucuparia*, granite, slate, and concrete; 7, 23, 24, 26–34, 36, a3 [O].

P. aipolia (Ehrh. ex Humb.) Fürnr. — on bark of *Alnus glutinosa*, *Betula* sp., *Juniperus communis*, *Malus domestica*, *Populus tremula*, *Quercus robur*, *Rosa* sp., *Salix* sp., *Sorbus aucuparia*, on concrete; 8, 14, 24, 28–31, 33, 34, 36 [O].

P. alnophila (Vain.) Loht. et al. — on bark of *Malus domestica*, *Quercus robur*, *Rosa* sp., *Salix* sp., *Sorbus aucuparia*; 29, 30, 32, 34 [R].

P. caesia (Hoffm.) Fürnr. — on granite, concrete, and iron; 1, 2, 10, 15, 26, 29, 32, 35, 36 [O].

P. dubia (Hoffm.) Lettau — on bark of *Juniperus communis*, *Malus domestica*, *Quercus robur*, *Rosa* sp., *Salix* sp., *Sorbus aucuparia*, on granite and concrete; 1, 10, 15, 22, 26, 29, 30, 32, 34–36 [O].

P. stellaris (L.) Nyl. — on bark of *Alnus glutinosa*, *Juniperus communis*, *Malus domestica*, *Quercus robur*, *Rosa* sp., *Sorbus aucuparia*; 22, 27, 29, 30, 32, 34, 35 [R].

P. tenella (Scop.) DC. — on bark of *Alnus glutinosa*, *Betula* sp., *Juniperus communis*, *Malus domestica*, *Populus tremula*, *Quercus robur*, *Rosa* sp., *Salix* sp., *Sorbus aucuparia*, on wood of *Sorbus aucuparia*, on granite, slate, and concrete; 1, 3, 4, 14, 22–24, 27–30, 32, 33, 35, 36, a3 [F].

Physconia distorta (With.) J. R. Laundon — on bark of *Populus tremula*; 14, 23 [R].

Placynthiella dasaea (Stirt.) Tønsberg — on bark of *Juniperus communis*, on wood of *Picea abies* and *Pinus sylvestris*, and on worked timber; 4, 6, 8, 25, 28, 36, 37 [R].

P. icmalea (Ach.) Coppins et P. James — on bark of *Betula* sp., *Pinus sylvestris*, on wood of *Picea abies* and *Pinus sylvestris*, on sandy soil and plant debris; 5–8, 12, 17, 25, 36, 37 [O].

P. oligotropha (J. R. Laundon) Coppins et P. James — on sandy soil; 5, 6, 11, 18, 20, 21, 36 [R].

P. uliginosa (Schrad.) Coppins et P. James — on bark of *Juniperus communis* and on soil; 6, 11, 20, 21, 28, 36 [R].

Platismatia glauca (L.) W. L. Culb. et C. F. Culb. — on bark of *Betula* sp., *Picea abies*, on wood of *Pinus sylvestris*; 9, 12, 22, 36 [R].

Polycauliona candelaria (L.) Frödén et al. — on bark of *Rosa* sp. and on granite; 1, 15, 26, 30, 32, 35 [R].

P. phlogina (Ach.) Arup et al. — on concrete; 15, 22, 36 [R].

P. polycarpa (Hoffm.) Frödén et al. — on bark of *Acer platanoides*, *Alnus glutinosa*, *Betula* sp., *Juniperus communis*, *Malus domestica*, *Padus avium*, *Pinus sylvestris*, *Populus tremula*, *Quercus robur*, *Rosa* sp., *Salix* sp., *Sorbus aucuparia*, on wood of *Sorbus aucuparia*, on granite; 3, 11, 14, 22, 24, 28–35 [O].

#*Polycoccum pulvinatum (Eitner) R. Sant. — on thallus of *Physcia caesia* on granite boulder; 32 [R_1]; LECB (*det. ET*).

Porpidia crustulata (Ach.) Hertel et Knoph — on worked timber; 36 [R_1].

Protoblastenia rupestris (Scop.) J. Steiner — on concrete; 22 [R_1].

Protoparmelia badia (Hoffm.) Hafellner — on granite; 5 [R_1].

P. oleagina (Harm.) Coppins — on wood of *Pinus sylvestris*; 5 [R_1].

Protoparmeliopsis muralis (Schreb.) M. Choisy — on granite and concrete; 1, 15, 28, 29, 30, 32, 36 [R].

Pseudevernia furfuracea (L.) Zopf — on bark of *Betula* sp., *Juniperus communis*, *Picea abies*, *Pinus sylvestris*, *Sorbus aucuparia*, on deadwood of *Pinus sylvestris* and worked timber; 3, 6, 9, 11, 12, 16, 21, 25, 30, 33, 36, a2 [O].

Pseudosagedia aenea (Wallr.) Hafellner et Kalb. — on bark of *Sorbus aucuparia*; 4 [R_1].

P. chlorotica (Ach.) Hafellner et Kalb — on granite; 22 [R_1].

Psilolechia clavulifera (Nyl.) Coppins — on upturned roots; a1 [R_1].

Pycnora sorophora (Vain.) Hafellner — on bark of *Betula* sp. and *Pinus sylvestris*, on wood of *P. sylvestris*; 12–14, 16 [R].

#*Pyrenidium actinellum Nyl. s. lat. — on thallus of *Protoparmeliopsis muralis* on granite boulder; 32 [R_1]; GSU (*det. AT*). New to the Leningrad Region, known from St. Petersburg (Stepanchikova *et al.*, 2021).

Ramalina farinacea (L.) Ach. — on bark of *Acer platanoides*, *Alnus glutinosa*, *Juniperus communis*, *Populus tremula*, *Quercus robur*, *Rosa* sp., *Salix* sp., *Sorbus aucuparia*, on granite; 3, 4, 16, 22–24, 27–31 [O].

R. fraxinea (L.) Ach. — on bark of *Malus domestica*, *Quercus robur*, *Rosa* sp., *Sorbus aucuparia*; 29–32, 34 [R].

R. pollinaria (Westr.) Ach. — on bark of *Rosa* sp.; 28 [R_1].

R. sinensis Jatta — on bark of *Rosa* sp.; 34 [R_1].

Rhizocarpon badioatrum (Flörke ex Spreng.) Th. Fr. — on granite; 5 [R_1].

R. distinctum Th. Fr. — on granite; 22, 28, 30, 32 [R].

R. geminatum Körb. — on granite; 1 [R_1].

R. geographicum (L.) DC. — on granite; 1, 5, 26, 32, 36 [R].

R. grande (Flörke ex Flot.) Arnold — on granite; 22, 36 [R].

R. macrosporum Räsänen — on granite; 5, 29, 30 [R].

R. richardii (Lamy ex Nyl.) Zahlbr. — on granite; 1, 10, 26, 30, 32 [R].

Rinodina confragosa (Ach.) Körb. — on granite; 22, 32 [R]. Thalli contain atranorin and zeorin.

R. gennarii Bagl. — on granite boulders and on concrete pier; 1, 2, 10, 15, 26, 32 [R].

R. milvina (Wahlenb.) Th. Fr. — on granite; 32 [R_1].

R. pyrina (Ach.) Arnold — on bark of *Salix* sp. and *Sorbus aucuparia*; 29, 30 [R].

R. septentrionalis Malme — on bark of *Acer platanoides*, *Padus avium*, *Rosa* sp., *Salix* sp.; 8, 22, 24, 28, 29 [R].

R. sophodes (Ach.) A. Massal. — on bark of *Alnus glutinosa*, *Malus domestica*, *Quercus robur*, *Sorbus aucuparia*; 29, 31, 32 [R].

Ropalospora viridis (Tønsberg) Tønsberg — on bark of *Alnus glutinosa*, *Betula* sp., *Sorbus aucuparia*; 3, 4, 23, 27, 29, 31, 37 [R].

Sagedia zonata Ach. — on granite boulders; 1, 29 [R].

+Sarea difformis (Fr.) Fr. — on resin of *Picea abies* and *Pinus sylvestris*; 8, 37 [R].

+S. resinae (Fr.) Kuntze — on resin of *Picea abies*; 37 [R_1].

Schaereria fuscocinerea (Nyl.) Clauzade et Cl. Roux — on granite boulders; 29, 30 [R].

Scoliciosporum chlorococcum (Graewe ex Stenh.) Vězda — on bark of *Picea abies*, *Pinus sylvestris*, *Rosa* sp., on wood of *Pinus sylvestris*; 9, 11–13, 35 [R].

S. sarothamni (Vain.) Vězda — on bark of *Acer platanoides*, *Alnus glutinosa*, *Betula* sp., *Juniperus communis*, *Malus domestica*, *Padus avium*, *Picea abies*, *Pinus sylvestris*, *Populus tremula*,

Quercus robur, *Rosa* sp., *Salix* sp., *Sorbus aucuparia*, on wood; 3, 4, 6–9, 11, 13, 14, 16, 18, 19, 21, 22, 24–37, a3 [C].

S. umbrinum (Ach.) Arnold — on bark of *Quercus robur* and on granite; 1, 5, 22, 26, 28–30 [R].

#Sphaerellothecium propinquellum (Nyl.) Cl. Roux et Triebel — on thalli of *Lecanora carpinea* on bark of *Acer platanoides*, *Quercus robur*, and *Salix* sp.; 22, 29 [R]; LECB (*det. IS*).

+Stenocybe pullatula (Ach.) Stein — on bark of *Alnus glutinosa*; 31 [R_1].

Stereocaulon alpinum Laurer — on pine deadwood and worked timber, on sandy soil; 5, 11, 18, 20, 36 [R].

S. condensatum Hoffm. — on sandy soil; 11, 36 [R].

S. glareosum (L. I. Savicz) H. Magn. — on sandy soil; 11, 17, 19–21, 36 [R].

†S. paschale (L.) Hoffm. — on sandy soil of dunes (Lemberg, 1933, 1935). No specimens found; the record probably refers to *S. taeniarum* (see Discussion).

S. taeniarum (H. Magn.) Kivistö — on sandy soil; 18 [R_1].

#*Stigmidium microcarpum Alstrup et J. C. David — on thallus of *Cetraria islandica* on soil; 11 [R_1]; GSU (*det. AT*). New to European Russia. Distribution in Russia: Yamal-Nenets Autonomous Area, republics of Buryatia and Sakha (Yakutia), Krasnoyarsk Territory, Chukotka Autonomous Area, Sakhalin Region, and Trans-Baikal Territory (Zhurbenko, 2002, 2009; Zhurbenko, Yakovchenko, 2014). Distribution in Fennoscandia and Baltic countries: Greenland and Denmark (Alstrup, 1993).

Our specimen perfectly matches description provided by Zhurbenko (2009) and Zhurbenko, Yakovchenko (2014). It has small perithecia 30–50 μm diam. embedded in stromatic tissue, producing on well-delimited brown necrotic patches of host tissues finally falling away. Interascal gel K/I–. Ascospores hyaline, smooth-walled, 1-septate, 7.5–9.0 × 2.5–3.0 μm.

Strangospora moriformis (Ach.) Stein — on wood of *Picea abies* and *Pinus sylvestris*; 12, 36, 37 [R].

#Talpapellis beschiana (Diederich) Zhurb. et al. — on thallus of *Cladonia deformis* on sandy soil; 5 [R_1]; GSU (*det. AT*).

Tephromela atra (Huds.) Hafellner — on granite boulders; 1, 5, 30, 32 [R].

Thelidium minutulum Körb. — on slate; 36 [R_1].

Toniniopsis separabilis (Nyl.) Gerasimova et A. Beck — on bark of *Populus tremula* and on mosses; 14, 37 (GenBank accession number: PP430599) [R].

Trapelia obtegens (Th. Fr.) Hertel — on granite boulder; 5 [R_1].

Trapeliopsis flexuosa (Fr.) Coppins et P. James — on bark of *Betula* sp., *Juniperus communis*, *Pinus sylvestris*, on wood of *Picea abies* and *Pinus sylvestris*, on plant debris; 5–9, 12, 13, 19, 22, 25, 28, 36, 37 [O].

Trapeliopsis granulosa (Hoffm.) Lumbsch — on wood of *Pinus sylvestris*, soil; 5, 6, 11, 17–21, 25, 36 [O].

#Tremella cladoniae Diederich et M. S. Christ. — on thalli of *Cladonia coniocraea*, *C. ochrochlora*, and *C. phyllophora* on mossy concrete, bark of *Betula* sp., and sandy soil; 16, 17, 22 [R]; LECB (*det. DH, IS, AR*).

#T. hypogymniae Diederich et M. S. Christ. — on thallus of *Hypogymnia physodes* on bark of *Pinus sylvestris*; 3 [R_1]; LECB (*det. IS*).

#T. lichenicola Diederich — on thallus of *Violella fucata* on bark of *Betula* sp.; 14 [R_1]; LECB (*det. DH, AR*).

Tuckermannopsis chlorophylla (Willd. ex Humb.) Hale — on bark of *Juniperus communis*, *Pinus sylvestris*, *Sorbus aucuparia*, on wood of *Pinus sylvestris*; 6, 8, 11, 12, 16, 30, 36 [R].

Umbilicaria deusta (L.) Baumg. — on granite boulders; 1, 5, 26, 28, 30, 32, 36 [R].

U. polyphylla (L.) Baumg. — on granite boulders; 5, 28, 36 [R].

U. torrefacta (Lightf.) Schrad. — on granite boulder; 32 [R_1].

Usnea hirta (L.) F. H. Wigg. — on bark of *Juniperus communis*, on bark and deadwood of *Pinus sylvestris*, on worked timber; 21, 28, 36, a2 [R].

U. subfloridana Stirt. — on bark of *Malus domestica* and *Salix* sp.; 24, a3 [R].

Verrucaria dolosa Hepp — on concrete; 22 (GenBank accession number: PP430598) [R_1].

V. muralis Ach. — on concrete; 22, 29 (GenBank accession numbers: PP430597, PP430594) [R].

Violella fucata (Stirt.) T. Sprib. — on bark of *Alnus glutinosa*, *Betula* sp., *Populus tremula*, *Salix* sp., *Sorbus aucuparia*, on wood of *Pinus sylvestris*; 3, 7, 9, 13, 14, 22–27, 37 [O].

Vulpicida pinastri (Scop.) J.-E. Mattsson et M. J. Lai — on bark of *Betula* sp., *Juniperus communis*, *Pinus sylvestris*, *Sorbus aucuparia*, deadwood of *Pinus sylvestris* and worked timber; 3–5, 7, 8, 11–13, 16, 25, 28, 30, 33, 36 [O].

Xanthocarpia crenulatella (Nyl.) Frödén et al. — on concrete; 29 [R_1].

Xanthoparmelia conspersa (Ehrh. ex Ach.) Hale — on granite; 5, 22, 26, 28–30, 32, 36 [O].

X. delisei (Duby) O. Blanco et al. — on granite boulders; 1, 32 [R]. Thalli contain gyrophoric (in one specimen), glomellic, glomelliferic, and perlatolic acids.

X. plittii (Gyeln.) Hale — on bark of *Juniperus communis*; 28 [R_1].

^{R}X. pulla (Ach.) O. Blanco et al. — on granite boulders; 1, 10, 26, 29, 30, 32, 36 [R].

X. stenophylla (Ach.) Ahti et D. Hawksw. — on granite; 22, 32, 36 [R].

Xanthoria parietina (L.) Th. Fr. — on bark of *Alnus glutinosa*, *Betula* sp., *Juniperus communis*, *Malus domestica*, *Pinus sylvestris*, *Populus tremula*, *Quercus robur*, *Rosa* sp., *Salix* sp., *Sorbus aucuparia*, on granite, slate, and concrete; 1, 8, 10, 14, 15, 22–24, 26–36, a3 [F].

#Xanthoriicola physciae (Kalchbr.) D. Hawksw. — on thalli of *Xanthoria parietina* on bark of *Malus domestica* and *Salix* sp.; 29 [R_1]; LECB (*det. IS*).

#Xenonectriella leptaleae (J. Steiner) Rossman et Lowen — on thallus of *Physcia aipolia* on bark of *Malus domestica*; 29 [R_1]; LECB (*det. IS*).

Xylographa opegraphella Nyl. ex Rothr. — on wood of *Pinus sylvestris*; 6 [R_1]. Thallus contains norstictic acid.

X. pallens (Nyl.) K. P. Malmgren — on wood of *Pinus sylvestris*; 6 (GenBank accession number: PP430600) [R_1]. Thallus contains stictic acid and 2 unknowns (contamination?).

Xylopsora caradocensis (Nyl.) Bendiksby et Timdal — on wood of *Pinus sylvestris*; 12 [R_1].

Discussion

The revealed lichen diversity of Seskar Island with adjacent islets and shoals has a total of 292 species, including 263 lichenized, 20 lichenicolous, and nine non-lichenized saprobic fungi. One species (*Stereocaulon paschale*) is known from historical data only, so far the modern lichen biota of the study area counts 291 species. Our results make a great difference in comparison with previously obtained data (only 22 lichen species were known from Seskar Island before our expedition). Nevertheless, a number of species does not go beyond expected. To compare, lists of species of the lichens and allied fungi of the nearest islands range from 349 to 160 species. The documented lichen biota of Moschny Island comprises 349 species (Stepanchikova *et al.*, 2019), followed by Bolshoy Tuters Island with a number of 331 species (Stepanchikova *et al.*,

2017), and, finally, Maly Island — 160 species (Stepanchikova *et al*., 2020). Though Seskar is twice smaller than Bolshoy Tuters, it has wider range of biotopes than Maly Island. Rocky outcrops could have enriched Seskar's lichen diversity, but unfortunately such habitats are not represented on the island. Noteworthy that 72 species were recorded in the Kokor Islet which previously was not investigated.

The list of species incorporates one species new to European Russia (*Stigmidium microcarpum*), four species new to North-Western European Russia (*Caloplaca alcarum*, *Cryptodiscus muriformis*, *C. pini*, *C. tabularum*), two species new to the LR (*Lecidella subviridis*, *Pyrenidium actinellum*), and one species new to WLR (*Niesslia keissleri*).

Lichens and allied fungi of Seskar Island have distribution pretty similar to ones in the other islands. The majority of species occurred rare, [R] and [R_1] (240 species, 82.5%), about a half of them (108 species, 37.1%) were registered only once [R_1]. Only 40 species (13.7%) were occasionally observed [O], eight (2.7%; *Cladonia coniocraea*, *Fuscidea pusilla*, *Lecanora carpinea*, *L. pulicaris*, *L. symmicta*, *Parmeliopsis ambigua*, *Physcia tenella*, *Xanthoria parietina*) were found frequently [F], three (1.0%; *Hypogymnia physodes*, *Parmelia sulcata*, *Scoliciosporum sarothamni*) were common [C]. An average amount of species on SA was 34.2 ± 2.9 with maximum and minimum, respectively, 86 (SA 36, territory of the former border post) and 4 (SA 2, N part of the island, Cape Tikrivi, granite boulders in supralittoral reed community). This number is congruent to our data from other islands: Moschny (41.6 ± 2.6, from 10 to 81 species per sample area), Maly (35.4 ± 2.5, from 28 to 43), and Tuters (32.0 ± 3.0, from 16 to 56) (Stepanchikova *et al*., 2017, 2019, 2020).

All 15 epiphytic lichen species, collected by N. Balashova in 1995, were found also during our field studies. This collection does not overlap with Lemberg's collection of seven terricolous species which were also recorded by us, except one. In his works Lemberg (1933, 1935) mentions *Stereocaulon paschale* as a widespread dune dweller. Unfortunately, we could not find even a single thallus of *S. paschale*. Instead, we once registered *S. taeniarum*. This taxon was distinguished from *S. paschale* (Kivistö, 1998) long after Lemberg made his research. Hence, we suspect that our find is related to the population which Lemberg observed, but occurrence of the species may have changed due to anthropogenic activities in past decades.

The majority of lichens were corticolous (128 species, 44.0%). The richest phorophytes were birch (58 lichen species, 19.9%) and pine (53 species, 18.2%). Significant number of species inhabited rowan (49 species, 16.8%), juniper (46, 15.8%), aspen (45 species, 15.5%), and black alder (41 species, 14.1%). It is noteworthy that rose bushes were housing the same number of species as oak (36 species, 12.4% each). Roses at Seskar Island predominantly occur in the seashore, they form dense cushions along boulder spits and shores, so it could be specific marine conditions which provide such diversity of their epiphytes. Other phorophytes were not so rich in lichens: willow (32 species, 11.0%), apple trees (30 species, 10.3%), spruce and maple (16 species, 5.5% each), bird cherry (14 species, 4.8%), and alpine currant (2 species, 0.7%). Lignicolous and saxicolous lichens were represented by almost equal amount of species (90 species,

30.9%, and 92 species, 31.6% respectively). The lichens were found both on deadwood (86 species, 29.6%) and worked timber (12 species, 4.1%). Mineral substrates, such as stones and iron hosted 92 species, including 70 species (24.1%) on granite, 31 species (10.7%) on concrete, 13 species (4.5%) on slate, and two species (0.7%) on iron. Terricolous lichens are less diverse than it could be expected taking in account landscapes and phytocoenoses of the island. Soil and plant debris in total were inhabited by 50 species (17.2%), most of which were found on sandy soil of dunes (42 species, 14.4%). Eight species (2.7%) were observed on mosses, and two on resin of conifers. Lichenicolous fungi are represented by 20 species (6.9%), and additionally two lichenicolous lichens (*Lambiella furvella* and *L. insularis*) were recorded in saxicolous communities.

Abandoned anthropogenic habitats provide lichens a wide range of ecological niches. Hence, these biotopes were most diverse in lichens. Within four sample plots 156 species occurred, or 53.6% of lichen diversity of Seskar Island. At that places lichens inhabited concrete, slate, and worked timber of former Soviet border post (SA 36, 87 species in total), mossy boulder fencings, building foundations and fruit trees in place of Finnish villages. Seashore communities combine anthropogenic potential for colonization with openness of natural granite boulder communities. Of totally 146 species (50.2%) belonging to seashores, 72 were registered on the sample plot, where remains of dwelled place smoothly dissolve into young forest and marine reed thickets. The lichens of dune communities of the eastern side of Seskar were represented by 107 species (36.8%). In sandy wastelands we found scattered old pine standing deadwood, which appeared to be suitable habitat for *Calicium tigillare* — rare species in NW European Russia, red-listed in the Leningrad Region (Krasnaya..., 2018). Closer to the seashore on both sides of old car track abundant population of red-listed *Flavocetraria nivalis* (Fig. 3F, G) was found. It is a remarkable recording due to severe vanishing of natural habitats of *F. nivalis* in LR. Now Seskar Island is the only known actual habitat of this species in LR, which gives an opportunity for appropriate assessment of conservation status of the species in the Red Data Book of the Leningrad Region. Forest communities of the island were not very rich in lichens, since all forests at the island are secondary. Altogether 92 lichen species (31.6%) were found in small-leaved forests, 68 (23.4%) were found in pine forests, and 30 (10.3%) in willow thickets.

Altogether five species known from Seskar Island are included in the Red Data Book of the Leningrad Region (Krasnaya..., 2018): *Calicium tigillare*, *Diarthonis spadicea*, *Flavocetraria nivalis*, *Melanelia stygia*, and *Xanthoparmelia pulla*. None of them was registered in the territory of State Nature Reserve "Vostok Finskogo Zaliva", partially located in the western shore of Seskar. We emphasize the fact that the most interesting (in terms of lichens) parts of Seskar now are leaved unprotected, though they are rewarding protection as a habitat of endangered species.

Indicator species of biologically valuable forests (Vyyavlenie..., 2009) are represented by three species: *Chaenotheca stemonea, Chaenothecopsis nigra, Hertelidea botryosa*. Each of them was found only once and was not accompanied by others, hence their presence does not indicate of biological value of the communities.

The lichen biota of Seskar Island is moderately rich compared to the other islands of the Gulf of Finland. Relatively low amount of epiphytes and terricolous lichens may be explained by high level of anthropogenic transformation of the island, as well as its relatively small size and uniform landscapes.

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