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New records of lichens and allied fungi from the Leningrad Region, Russia. V

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Abstract: Eight species of lichens and seven lichenicolous fungi are reported from the Leningrad Region. *Agonimia repleta*, *Protoparmelia hypotremella* and *Stereocaulon taeniarum* are reported for the first time for Russia; *Clypeococcum cetrariae* is new to the European Russia; *Lepraria nivalis*, *Merismatium* aff. *nigritellum* (on *Physcia aipolia*) and *Stigmidium lepraria*e are new to the North-Western European Russia; *Cladonia macroceras*, *C. strepsilis*, *Endococcus fusiger*, *Lichenoconium erodens*, *Lobothallia melanaspis*, *Niesslia cladoniicola* and *Skyttella mulleri* are new to the Leningrad Region; *Sclerophora coniophaea* is new to Saint Petersburg. The most noteworthy records are briefly discussed.

INTRODUCTION

This paper is next in the series of publications on new records of lichens and allied fungi in the Leningrad Region and Saint Petersburg (Kuznetsova et al., 2007; Stepanchikova et al., 2009, 2010, 2011a,b; Kuznetsova et al., 2012; Pykälä et al., 2012; Himelbrant et al., 2013) to contribute to the knowledge on the regional lichen flora. Among the 15 taxa, several are recorded for the first time in Saint Petersburg or Leningrad Region, others are new for the North-Western European Russia, European Russia or Russian Federation.

MATERIAL AND METHODS

The materials were collected mainly in the period of 2011–2013 in the Eastern and Western Leningrad Region or Saint Petersburg (ELR, WLR, SPb respectively) and were deposited in the lichen herbaria of Saint Petersburg State University (LECB), Nature Research Centre, Institute of Botany in Vilnius (BILAS) and Botanical Museum of University of Helsinki (H). Most specimens of lichenicolous fungi were identified by J. Motiejūnaitė, lichens and *Clypeococcum cetrariae* by D. Himelbrant, I. Stepanchikova and G. Tagirdzhanova. Lichen substances in the thalli of *Protoparmelia hypotremella* and *Stereocaulon taeniarum* were analyzed by using the standard technique of high performance thin-layer chromatography (HPTLC) in solvent systems A, B and C (Orange et al., 2001). The illustrations of *Clypeococcum cetrariae* and *Protoparmelia hypotremella* were made by using a Carl Zeiss STEMI-2000 CS dissecting microscope with an AxioCam ICc 3 camera and light microscope Carl Zeiss Axioskop 40 with camera QImaging MicroPublisher 5.0 RTV. Brief discussions on the most interesting records (new to NW European Russia, European Russia or Russian Federation) are provided.

The names of the main collectors in the species list are abbreviated as follows: DH – Dmitry E. Himelbrant, GT – Gulnara M. Tagirdzhanova, IS – Irina S. Stepanchikova. The subdivision of the Leningrad Region (LR) was published in our previous paper (Stepanchikova et al., 2010). The biogeographical provinces of Eastern Fennoscandia are abbreviated traditionally (Kotiranta et al., 1998): Ik – Isthmus karelicus, Ka – Karelia australis. Lichenicolous fungi are marked with #. The nomenclature of taxa follows mainly Nordin et al. (2011).

THE SPECIES

Agonimia repleta Czarnota & Coppins – WLR, Kingisepp District, Kurgal'sky Peninsula,

Kurgal'sky protected area, NE of Tiskolovo village, seashore slope of the Gulf of Narva, 59°43'20''N, 28°02'05''E, broadleaved forest on the slope, bark of old *Fraxinus excelsior* L., 14.04.2007, leg. DH (H). – New to Russia. Distribution in Fennoscandia and Baltic countries: Sweden, Finland (Nordin et al., 2011). This species is characterized by granular to granular-verrucose thallus, black pyriform perithecia to 0.2 mm in diameter with vertical channels at the apical part, 8-spored asci and rather small ascospores not exceeding 50 µm at length (Czarnota & Coppins, 2000).

Cladonia macroceras (Delise) Hav. – WLR, Ka, Vyborg District, the Gulf of Vyborg, Vyborgsky protected area, Mayachny Island, 60°34'24''N, 28°25'30''E, moss-lichen community on rocks, on soil, 11.09.2013, leg. DH, IS & GT (LECB); WLR, Ka, Vyborg District, the Gulf of Vyborg, Vyborgsky protected area, Krasivy Island, 60°32'59''N, 28°34'16''E, moss-lichen community on rocky outcrops, on soil, 14.09.2013, leg. DH, IS & GT (LECB); WLR, Ka, Vyborg District, the Gulf of Vyborg, Vyborgsky protected area, Travnik Island, 60°32'50''N, 28°33'57''E, strongly disturbed moss-lichen community on rocky outcrops, on soil, 14.09.2013, leg. DH, IS & GT (LECB). – New to LR. Reported from LR erroneously by Sokolova (1995) on the base of uncertain record; no specimens present in herbaria. Distribution in North-Western European Russia outside of LR: Republic of Karelia (Fadeeva et al., 2007). Distribution in Fennoscandia and Baltic countries: Norway, Sweden, Finland (Nordin et al., 2011), Estonia (Randlane et al., 2013). The species represents *Cladonia gracilis* group and is distinguished mainly by shiny, tough, thick cortex of podetia, presence of podetial and primary squamules, as far as inhabiting rocky outcrops or calcareous soil (Ahti & Stenroos, 2013).

Cladonia strepsilis (Ach.) Grognot – WLR, Luga District, left bank of the Yaschera River, vicinity of the village Yaschera, 1.2 km NE of the confluence of the rivers Luga and Yaschera, S slope of small hill, near the sandy road, 58°53'20''N, 29°49'41''E, open pine forest with lichens, *Calluna vulgaris* (L.) Hull and mosses, on sandy soil together with *Pycnothelia papillaria* (Ehrh.) L. M. Dufour, 19.05.2013, leg. DH & IS (LECB). – New to LR. Distribution in North-Western European Russia outside of LR: Republic of Karelia (Fadeeva et al., 2007). Distribution in Fennoscandia and Baltic countries: Norway, Sweden, Finland (Nordin et al., 2011), Latvia (Piterāns, 2001). Easily recognized with unique C+ blue-green thallus reaction (strepsilin), poorly developed podetia and forming dense cushions of rigid and elongated squamules (Ahti & Stenroos, 2013).

Clypeococcum cetrariae Hafellner – WLR, Luga District, left bank of the Yaschera River, vicinity of the village Yaschera, 1.2 km NE of the confluence of the rivers Luga and Yaschera, S slope of small hill, near the sandy road, 58°53'20''N, 29°49'41''E, open pine forest with lichens, *Calluna vulgaris* and mosses, on thallus of *Cetraria islandica* (L.) Ach. on sandy soil, 19.05.2013, leg. DH & IS (LECB). – New to European Russia. Known from Republic of Sakha (Yakutia) (Zhurbenko, 2007b) and Krasnoyarsk Territory (Zhurbenko & Zhdanov, 2013). Distribution in Fennoscandia and Baltic countries: Estonia (Randlane et al., 2013), Latvia (Motiejūnaitė & Piterāns, 1998), Lithuania (Motiejūnaitė et al., 2011). Lichenicolous fungus, easily recognized by forming visible black clypeus with numerous black pseudothecia, 4-spored asci with one-septate dark brown verrucose ascospores and growing on thalli of *C. islandica* (Hafellner, 1994; Zhurbenko & Zhdanov, 2013) (Fig. 1).

Endococcus fusiger Th. Fr. & Almq. – WLR, Ka, Vyborg District, the Gulf of Vyborg, Vyborgsky protected area, Bol'shoy Lugovoy Island, 60°32'38''N, 28°33'43''E, seashore black alder forest with bird cherry and *Calamagrostis* sp., on thallus of *Rhizocarpon geminatum* Körb. on siliceous bolder, 13.09.2013, leg. DH, IS & GT (BILAS); WLR, Ka, Vyborg District, the Gulf of Vyborg, Vyborgsky protected area, Travnik Island, 60°32'44''N, 28°34'00''E, seashore black alder forest with bird cherry, *Convallaria majalis* L. and grasses, on thallus of *Rhizocarpon reductum* Th. Fr. on siliceous boulder, 14.09.2013, leg. DH, IS & GT (BILAS). – New to LR. Known from different territories of Russia (e. g. Fadeeva et al., 2007; Zhurbenko, 2009b) as a part of *E. perpusillus* Nyl. complex. Distribution in North-Western European Russia outside of LR: Republic of Karelia (Fadeeva et al., 2007). Distribution in Fennoscandia and Baltic countries: Sweden (Nordin et al., 2011). *E. fusiger* is a problematic species of a notoriously complicated *E. perpusillus* complex. It was not

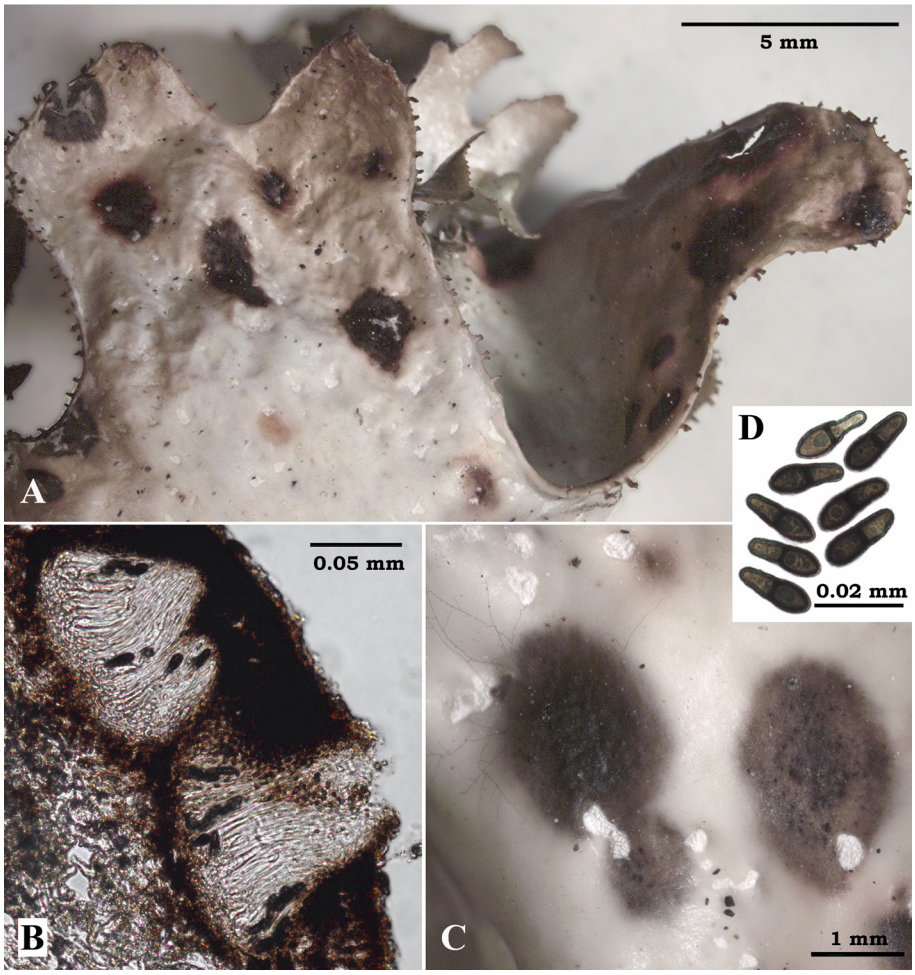

Fig. 1. *Clypeococcum cetrariae*: A – infected thallus of *Cetraria islandica*; B – pseudothecia; C – clypei with numerous black pseudothecia; D – ascospores.

recognized by Triebel (1989) and Ihlen & Wedin (2008) who considered it to be conspecific with *E. perpusillus* but Sérusiaux et al. (1999), applying narrower species concept, distinguished three species of *Endococcus* growing on *Rhizocarpon*. Of these, *E. fusiger* is characterised mainly by superficial apothecia. Though Sérusiaux et al. (1999) indicated *E. fusiger* having spore size 12.5–16 × 6–7 µm, though later authors (Kocourková, 2000, Kukwa & Flakus, 2009) showed that the spores may be longer or narrower and type diagnosis indicates spore size 15–18 × 5–6 µm (according to Kocourková, 2000), however, perithecia are always sessile and rather large. In both our specimens perithecia were always sessile, rather large (150–180 µm diam.), and spores were 12–16 × 5–6 µm, slightly narrower than indicated by Sérusiaux et al. (1999).

Lepraria nivalis J. R. Laundon – SPb, Pushkin District, Ekatereninsky park, Bolshoj Kapriz flag stone hill, 59°42'48''N, 30°22'60''E, on vertical flag stones, 12.08.2012, leg. IS (LECB). Specimen contains psoromic, protocetraric acids and trace of gyrophoric/lecanoric acid. New to European Russia. Distribution in Russia is still unclear. It was reported from Southern Ural, Southern Siberia and Russian Caucasus (Urbanavichus, 2010; Urbanavichus & Urbanavichene, 2010). However this data seems to be doubtful because

the previously published records not based on analysis of lichen substances (see Urbanavichus & Urbanavichene, 2010 and discussion in Urbanavichene et al., 2013, under *Lepraria crassissima*). Distribution in Fennoscandia and Baltic countries: Sweden, Finland (Nordin et al., 2011). The species is morphologically very close to *L. crassissima* (Hue) Lettau, but the later has different chemistry (divaricatic and nordivaricatic acid, zeorin) and ecology: *L. nivalis* is mostly confined to calcareous substrates while *L. crassissima* generally prefers siliceous rocks (see Saag et al., 2009).

Lichenoconium erodens M. S. Christ. & D. Hawksw. – WLR, Ka, Vyborg District, the Gulf of Vyborg, Vyborgsky protected area, Bol'shoy Lugovoy Island, 60°32'50''N, 28°33'32''E, birch-pine forest with *Convallaria majalis*, *Vaccinium myrtillus* L. and mosses, on thallus of *Hypogymnia physodes* (L.) Nyl. on bark of *Sorbus aucuparia* L., 13.09.2013, leg. DH, IS & GT (BILAS). – New to LR. Distribution in North-Western European Russia outside of LR: Republic of Karelia (Zhurbenko & Himelbrant, 2002; Fadeeva et al., 2007). Distribution in Fennoscandia and Baltic countries: Norway, Sweden, Finland (Nordin et al., 2011), Estonia (Randlane et al., 2013), Latvia (Motiejūnaitė et al., 2006), Lithuania (Motiejūnaitė, 1999).

Lobothallia melanaspis (Ach.) Hafellner – WLR, Ik, Priozersk District, E of Pyatirech'e village (former Finnish Viisjoki), Ladoga Lake shore, the end of Daleky Cape (former Saunaniemi), stony military mole with fortifications (Saunasaari), 60°34'15''N, 30°41'09''E, on granite, 05.08.2011, IS & Ludmila Gagarina (LECB). – New to LR. Distribution in North-Western European Russia outside of LR: Republic of Karelia (Fadeeva et al., 2007). Distribution in Fennoscandia and Baltic countries: Norway, Sweden, Finland (Nordin et al., 2011).

Merismatium aff. nigritellum (Nyl.) Vouaux – ELR, Tikhvin District, Vepssky Les protected area, ca. 50 km SSE of Vinnitsy, 60°13'34''N, 35°08'25''E, on thallus of *Physcia aipolia* (Ehrh. ex Humb.) Fürnr. on bark of *Populus tremula* L., 17.08.2012, leg. GT, IS & Lilia Kuz'mina (BILAS). – New to North-Western European Russia. Known from different territories of Arctic Siberia (Zhurbenko, 2009b). Distribution in Fennoscandia and Baltic countries: Norway, Sweden, Finland (Nordin et al., 2011).

M. nigritellum apparently is a a complex of species, originally it was considered to grow only on crustose lichens, especially on muscicolous species (Triebel, 1989), but Etayo and Sancho (2008) found it also on *Stereocaulon*, and Eichler et al. (2010) indicate *Leptogium* as a host. According to various authors, the measurements in *M. nigritellum* also show rather wide range: ascomata 150–300 µm and ascospores 14–32 × 6.5–15 µm. Our specimen, apart from unusual host – *P. aipolia*, in all other details showed close affinity with *M. nigritellum*: ascomata measured 160–170, ascospores were brown, not constricted at the septa, submuriform (with 4–6 latitudinal and 2–3 longitudinal septa), lacking halo, 18–20 × 6–8 µm.

Niesslia cladoniicola D. Hawksw. & W. Gams – WLR, Ik, Vsevolozhsk District, Termolovsky protected area, ca. 4.5 km NNW of Elizavetinka village, 60°18'30''N, 30°10'39''E, birch forest with spruces, *Vaccinium myrtillus* and *Sphagnum* spp., on thallus of *Cladonia* sp. on bark of tree, 09.09.2011, leg. IS & DH (BILAS). – New to LR. Distribution in North-Western European Russia outside of LR: Republic of Karelia (Fadeeva et al., 2007). Distribution in Fennoscandia and Baltic countries: Sweden, Finland (Nordin et al., 2011), Estonia (Randlane et al., 2013).

Protoparmelia hypotremella van Herk, Spier & Wirth – ELR, Volkhov District, W shore of Zagubsky Peninsula between Mel'nichny stream and Cherny cape, 60°28'46–55''N, 32°36'08–23''E, mixed spruce-maple-lime-black alder forest, on bark of old *Tilia cordata* Mill., 21.05.2011, leg. DH, IS & Ekaterina Kuznetsova (LECB). New to Russia. Distribution in Fennoscandia and Baltic countries: Sweden (Nordin et al., 2011). Sterile lichen characterized by grey to pale olivaceous to buff, dull to slightly glossy, granular (sometimes of isidia-like granules) to microsquamulose thallus (Fig. 2), squamules up to 0.6 mm wide with margins paler than the surface (Aptroot et al., 1997).

Sclerophora coniophaea (Norman) Mattsson & Middelb. – SPb, Kurortny District, Sestroretsk, N part of Dubki Park, 60°05'31''N, 29°56'03''E, in bark crevices of very old *Quercus robur* L., 01.06.2013, leg. DH and Ekaterina Kuznetsova

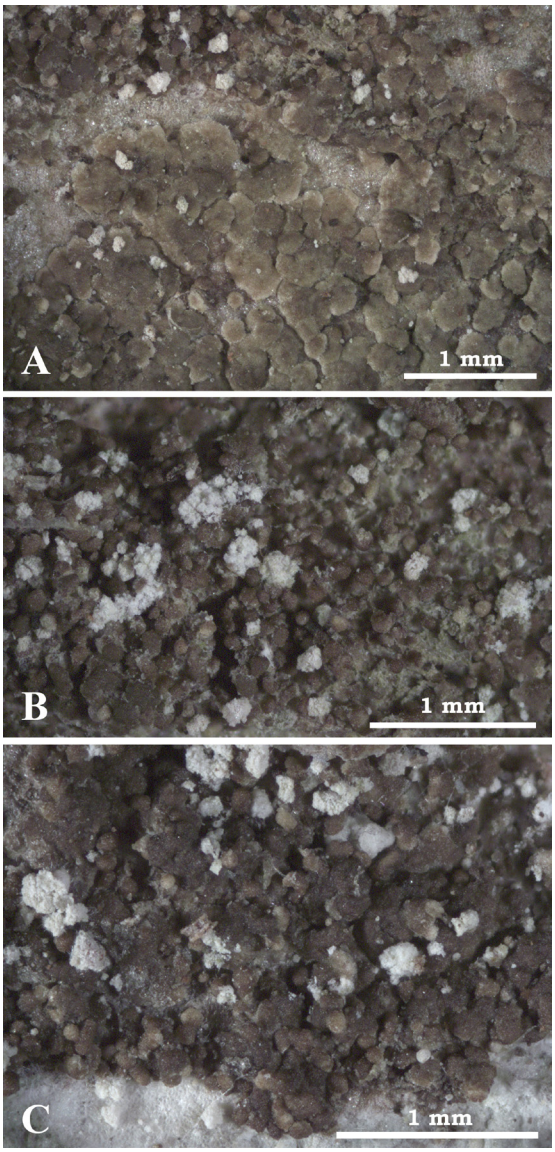

Fig. 2. *Protoparmelia hypotremella*: A – microsquamulose thallus (brown squamules with paler margins); B, C – isidia-like granules.

(LECB). – New to SPb. Known from ELR (Stepanchikova et al., 2009) and WLR (Stepanchikova et al., 2011b). Distribution in North-Western European Russia outside of LR: Republic of Karelia (Fadeeva et al., 2007). Distribution in Fennoscandia and Baltic countries: Norway, Sweden, Finland (Nordin et al., 2011), Estonia (Randlane et al., 2013), Lithuania (Motiejūnaitė et al., 2004). Indicator of biologically valuable forests in the Southern Taiga of North-Western European Russia (Andersson et al., 2009).

Skyttella mulleri (Willey) D. Hawksw. & R. Sant. – ELR, Podporozhje District, ca. 4 km SSW of the village Yandeba, the Chaldoga River valley, 60°48'01''N, 34°00'17''E, aspen-spruce forest with *Convallaria majalis* and *Oxalis acetosella* L., on *Peltigera praetextata* (Flörke ex Sommerf.) Zopf. on bark of *Populus tremula*, 23.07.2013, leg. IS (BILAS). – New to LR. Distribution in North-Western European Russia outside of LR: Republic of Karelia (Fadeeva et al., 2007). Distribution in Fennoscandia and Baltic countries: Norway, Sweden, Finland (Nordin et al., 2011).

Stereocaulon taeniarum (H. Magn.) Kivistö – WLR, Ka, Vyborg District, the Gulf of Vyborg, Vyborgsky protected area, Mayachny Island, 60°34'24''N, 28°25'30''E, moss-lichen community on rocks, and 60°34'25''N, 28°25'24''E, seashore rocky outcrops with pines, both collected on soil, 11.09.2013, leg. DH, IS & GT (LECB). Specimens contain atranorin and lobaric acid. – New to Russia. Distribution in Fennoscandia and Baltic countries: Sweden, Finland (Nordin et al., 2011), Lithuania (Motiejūnaitė et al., 2013). Separated from *S. paschale* (L.) Hoffm. by the absence of distinct cephalodia, by thick axis, few branchlets, and phyllocladia that cover the pseudopodetia all around; mainly with coastal distribution (Kivistö, 1998).

Stigmidium leprariae Zhurb. – WLR, Ka, Vyborg District, the Gulf of Vyborg, Vyborgsky protected area, Bol'shoy Lugovoy Island, 60°32'50''N, 28°33'32''E, birch-pine forest with *Convallaria majalis*, *Vaccinium myrtillus* and mosses, on thallus of *Lepraria* sp. on siliceous stone, 13.09.2013, leg. DH, IS & GT (BILAS). – New to North-Western European Russia. Known from Murmansk Region (Zhurbenko, 2009a). Distribution in Fennoscandia and Baltic countries: Norway (Nordin et al., 2011). Recently described *Stigmidium leprariae* was known from the thalli of *Lepraria neglecta* group only (Zhurbenko, 2007a, 2009a; Kukwa & Flakus, 2009). Present specimen is in accordance with the protologue (Zhurbenko, 2007a), with numerous black perithecia 50–80 µm in diam., ascospores 11–13 × 4–5 µm, sole-shaped, guttulate, one-septate (no 2–3-septate spores were observed), slightly con-

stricted at the septum, smooth-walled, colourless to pale grey olive. Vegetative hyphae were not apparent on the host granules, but thallus showed some slight discolouration where perithecia of the fungus were especially numerous.

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