

# RESEARCH NOTES

# НАУЧНЫЕ ЗАМЕТКИ

## FIRST RECORDS OF LICHENISED AND LICHENICOLOUS FUNGI FOR THE LICHEN FLORA OF RUSSIA AND EASTERN EUROPE

Gennadii P. Urbanavichus<sup>1</sup> , Irina N. Urbanavichene<sup>2,\*</sup> 

<sup>1</sup>*Institute of North Industrial Ecology Problems, FRC «Kola Science Centre of RAS», Russia*

<sup>2</sup>*Komarov Botanical Institute of RAS, Russia*

\*e-mail: [urbanavichene@gmail.com](mailto:urbanavichene@gmail.com)

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Noteworthy findings of two lichen species and four lichenicolous fungi are presented. Two species, *Celothelium ischnobelum* collected from the Nizhnii Novgorod Region and *Opegrapha reactiva* from the Murmansk Region, are reported for the first time for Russia and Eastern Europe. Four species, *Arthonia destruens*, *Lichenochora galigena*, and *Schizoxylon albescens* collected in the Nizhnii Novgorod Region, and *Sphaeropezia cucularis* in the Murmansk Region, are new for European Russia. The genus *Celothelium* is reported for the first time for Russia.

**Key words:** *Celothelium ischnobelum*, Kerzhensky State Nature Reserve, lichens, new records, *Opegrapha reactiva*

This paper continues the series of publications on new and important findings of lichens and lichenicolous fungi from various Russian regions (e.g. Urbanavichus & Urbanavichene, 2018, 2021; Urbanavichene & Urbanavichus, 2020, 2021). The North-European Russian lichen flora is among the most thoroughly studied in the country due to the long lichenological tradition lasting more than two centuries and intensity of floristic studies in the last two decades. On the other hand, in the centre and south of European Russia, the lichen flora is generally less studied, despite more than a century of lichenological studies in this area. Fortunately, the intensity of floristic research in Central-European Russia has accelerated in recent years (e.g. Muchnik & Breuss, 2015; Muchnik et al., 2019; Muchnik, 2020).

The paper is based on specimens collected by the authors in 2020–2021 in North-European Russia, Murmansk Region (MR) and Central-European Russia, Nizhnii Novgorod Region (NNR). The specimens were examined by standard microscopic techniques. Measurements of well-developed ascospores lying outside the asci were made in water at  $\times 1000$  magnification. The specimens are deposited in the lichen herbaria of the Komarov Botanical Institute of RAS (LE), Institute of North Industrial Ecology Problems, Kola Science Centre of RAS in Apatity (INEP) and in the private collection of G. Urbanavichus (hb. Urbanavichus).

*Arthonia destruens* Rehm (Fig. 1S): NNR, Bor district, Kerzhensky State Nature Reserve, the southern part of forest quarter №3, 56.59866° N, 44.99190° E, 120 m a.s.l., secondary mixed forest

with *Pinus sylvestris* L., *Betula* sp. and *Populus tremula* L. on the site of a former settlement, lichenicolous fungus on a moribund thallus of *Physcia aipolia* (Ehrh. ex Humb.) Fűrnr. on a branch of old aspen, 08.05.2021, G. Urbanavichus (hb. Urbanavichus). Note: It is a new species for European Russia. In Russia, the species was previously known in the Caucasus, Republic of Adygea (Zhurbenko, 2017). *Arthonia destruens* is known from scattered reports in both hemispheres (Brackel, 2014). The species is superficially similar to *A. epiphyscia* Nyl., which also grows on *Physcia* spp., but it can be distinguished by an internal yellowish, K+ purple-lilac pigment and longer ascospores (10.5–17.0 vs. 10–14  $\mu\text{m}$ ) (Cannon et al., 2020).

*Celothelium ischnobelum* (Nyl.) M.B. Aguirre (Fig. 2S): NNR, Bor district, Kerzhensky State Nature Reserve, forest quarter №193, 56.43151° N, 45.10437° E, 95 m a.s.l., brook Bugrovka, floodplain *Alnus glutinosa* (L.) Gaertn. forest with *Populus tremula* and single *Quercus robur* L., on bark of *Q. robur*, 12.06.2020, I. Urbanavichene (LE). Note: The genus *Celothelium* is reported for the first time for Russia and Eastern Europe. This is a highly unexpected finding, since *C. ischnobelum* is a rare species in Europe and it seems to be mostly restricted to Atlantic and well-preserved areas (Sérusiaux et al., 2003). This species is characterised by a smooth pale-green or creamy thallus with *Trentepohlia* photobiont. The found specimen lacks apothecia; only pycnidia are present. Pycnidia are circular to elongated, black, shiny, smooth, 400–600  $\mu\text{m}$  in length, semi-immersed in the bark, superficial, hemispheri-

cal; ostiole is not seen. Macroconidia are colourless, filiform,  $60\text{--}100 \times 1.5\text{--}2.0 \mu\text{m}$ , thin-walled, smooth and multiseptate; each cell contains numerous refringent particles (Aguirre-Hudson, 1991).

*Lichenochora galligena* R. Sant. & Hafellner (Fig. 3S): NNR, Bor district, Kerzhensky State Nature Reserve, the southern part of forest quarter №3,  $56.59866^\circ \text{N}$ ,  $44.99190^\circ \text{E}$ , 120 m a.s.l., secondary mixed forest with *Pinus sylvestris*, *Betula* sp. and *Populus tremula* on the site of a former settlement, lichenicolous fungus on a moribund thallus and apothecia of *Physcia alnophila* (Vain.) Loht. et al. on a branch of an old aspen, 08.05.2021, G. Urbanavichus (hb. Urbanavichus). Note: It is a new species for European Russia. In Russia, the species was recently reported from its Asian part, Kamchatsky Krai (Zhurbenko et al., 2020). This species was formerly known from scattered reports in Europe, North and South America, and in Africa (Brackel, 2014). *Lichenochora galligena* is distinguished from other species of *Lichenochora* also growing on *Physcia* spp. by its eight-spored asci and homopolar, small 1-septate ascospores,  $9\text{--}11 \times 6\text{--}8 \mu\text{m}$ .

*Opegrapha reactiva* (Alstrup & D. Hawksw.) Etayo & Diederich (Fig. 4S): MR, Lovozero district, northeast of Fedorova Tundra Mt.,  $67.49116^\circ \text{N}$ ,  $35.06697^\circ \text{E}$ , 210 m a.s.l., rapids on a small unnamed stream, lichenicolous fungus on thallus of *Ionaspis lacustris* (With.) Lutzoni on rocks in the stream bed, 11.08.2021, G. Urbanavichus (INEP, LE, hb. Urbanavichus). Note: It is a new species for Russia and Eastern Europe. This rare species was initially described from Greenland (Alstrup & Hawksworth, 1990), and later reported from several Central European countries and Chile (Orange, 2002; Sérusiaux et al., 2003; Roux et al., 2007; Etayo & Sancho, 2008). This species is characterised by its loosely aggregated, perithecial ascomata up to 100  $\mu\text{m}$  in diameter, immersed in the host thallus, I+ pale blue hymenium and four-septate, smooth-walled ascospores,  $18\text{--}24 \times 5\text{--}7 \mu\text{m}$ , sometimes constricted at the septa.

*Schizoxylon albescens* Gilenstam, Döring & Wedin (Fig. 5S): NNR, Bor district, Kerzhensky State Nature Reserve, the southern part of forest quarter №3,  $56.59866^\circ \text{N}$ ,  $44.99190^\circ \text{E}$ , 120 m a.s.l., secondary mixed forest with *Pinus sylvestris*, *Betula* sp. and *Populus tremula* on the site of a former settlement, on a branch of old aspen, 08.05.2021, G. Urbanavichus (hb. Urbanavichus). Note: This is an optionally lichenised species, new for European Russia. In Russia, the species was

formerly known from several regions in Siberia (Czernyadjeva et al., 2020).

*Sphaeropezia cucularis* (Norman) Baloch & Wedin (Fig. 6S): MR, Kandalaksha district, Iso-kumpu place, 22 km west of Alakurtti settlement,  $66.93911^\circ \text{N}$ ,  $29.85403^\circ \text{E}$ , 360 m a.s.l., old-growth forest with *Picea abies* (L.) H. Karst., and *Pinus sylvestris*, lichenicolous fungus on thallus of *Parmeliopsis ambigua* (Wulfen) Nyl. on bark of *Pinus sylvestris*, 03.08.2021, G. Urbanavichus (INEP, hb. Urbanavichus). Note: It is a new species for European Russia. In Russia, the species was formerly known from Southern Siberia, Krasnoyarsky Krai (Zhurbenko, 2009). The nearest locality is the neighbouring territory of Finnmark in Norway (Westberg et al., 2021).

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### Supporting Information

Photographs of the found species (Electronic Supplement. Illustrations of lichens and lichenicolous fungi in the paper «First records of lichenised and lichenicolous fungi for the lichen flora of Russia and Eastern Europe») may be found in the [Supporting Information](#).

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## ПЕРВЫЕ НАХОДКИ ЛИХЕНИЗИРОВАННЫХ И ЛИХЕНОФИЛЬНЫХ ГРИБОВ ДЛЯ ЛИХЕНОФЛОРЫ РОССИИ И ВОСТОЧНОЙ ЕВРОПЫ

Г. П. Урбанавичюс<sup>1</sup> , И. Н. Урбанавичене<sup>2,\*</sup> 

<sup>1</sup>Институт проблем промышленной экологии ФИЦ «Кольский научный центр РАН», Россия

<sup>2</sup>Ботанический институт имени В.Л. Комарова РАН, Россия

\*e-mail: urbanavichene@gmail.com

Представлены заслуживающие внимания находки двух видов лишайников и четырех видов лихенофильных грибов. Два вида (*Celothelium ischnobelum* из Нижегородской области и *Opegrapha reactiva* из Мурманской области) приводятся впервые для России и Восточной Европы. Четыре вида (*Arthonia destruens*, *Lichenochora galligena* и *Schizoxylon albescens* из Нижегородской области и *Sphaeropezia cucularis* из Мурманской области) являются новыми для европейской части России. Род *Celothelium* впервые найден в России.

**Ключевые слова:** *Celothelium ischnobelum*, *Opegrapha reactiva*, Керженский заповедник, лишайники, новые находки