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Additions to the lichen flora of the Kologriv Forest Reserve and Kostroma Region

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Keywords: diversity, European Russia, *Micarea melanobola*, Nature Reserve, new records.

Summary. As a result of determining the lichens collected in summer 2020 in the territory of the Kologriv Forest State Nature Reserve (Kostroma Region), 57 species (44 lichens, 5 non-lichenized and 8 lichenicolous fungi) new to the lichen flora of the Reserve were identified. Among them, 49 species and 17 genera (*Acrocordia, Allocalicium, Acarospora, Biatoridium, Catinaria, Cryptodiscus, Didymocyrtis, Fellhanera, Inoderma, Intralichen, Lichenoconium, Melaspileella, Rebentischia, Schismatomma, Sclerococcum, Thelidium,* and *Tremella*) are new for the Kostroma Region. *Micarea melanobola* is new for Russia. The genus *Rebentischia* with species *R. massalongii* as well as *Ramalina vogulica* are published for the first time for the European Russia. Five species: *Allocalicium adaequatum, Bryoria glabra, Japewia subaurifera, Sclerococcum simplex,* and *Tremella hypogymniae* – are reported as new records for the Middle Russia. Information on habitats, substrates and distribution in the neighboring regions is provided.

Дополнения к лихенофлоре заповедника «Кологривский лес» и Костромской области

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Ключевые слова: Европейская Россия, новые находки, природный заповедник, разнообразие, *Micarea melanobola*.

Аннотация. В результате определения коллекции лишайников, собранных летом 2020 г. на территории государственного природного заповедника «Кологривский лес» (Кологривский р-н, Костромская обл.), было выявлено 57 видов, новых для лихенофлоры заповедника (44 вида лишайников, 5 нелихенизированных и 8 лихенофильных видов грибов). Среди них 49 видов и 17 родов (*Acrocordia, Allocalicium, Acarospora, Biatoridium, Catinaria, Cryptodiscus, Didymocyrtis, Fellhanera, Inoderma, Intralichen, Lichenoconium, Melaspileella, Rebentischia, Schismatomma, Sclerococcum, Thelidium Tremella*) – новые для Костромской обл. *Micarea melanobola* – вид новый для России. Впервые для Европейской России опубликованы род *Rebentischia* с видом *R. massalongii,* и *Ramalina vogulica*. Находки пяти видов – *Allocalicium adaequatum, Bryoria glabra, Japewia subaurifera, Sclerococcum simplex, Tremella hypogymniae* – являются первыми указаниями для средней полосы России. Приводится информация о местообитаниях, субстратах и распространении видов в соседних регионах.

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Introduction

The lichen flora of Kostroma Region is one of the poorly-studied of the European part of Russia. Prior to this study, the lichen flora of the Kologriv Forest Reserve comprises 250 species and the Kostroma Region 294 species (Elenkin, 1906, 1907, 1911; Ladyzhenskaya, 1931; Kuznetsova, Skazina, 2010; Himelbrant et al., 2018; Urbanavichene, Urbanavichus, 2019b, 2020). This article presents additions to existing data of the lichen flora of the Kostroma Region and Kologriv Forest Reserve.

The main part of the Kostroma Region is located in the southern taiga subzone. A significant part of the natural forest landscapes of the region has been greatly transformed as a result of many years of human activity. Currently, the forest occupies ca. 74 % of the region area, 2/3 of them are young or middle-aged tree stands. Kologriv Forest Reserve was established in 2006 in the northern part of the Kostroma Region (58°55′N, 43°52′E) to preserve the southern taiga nature landscapes. Our field studies were carried out in the best-conserved old-growth fir-spruce (*Abies sibirica* Ledeb., *Picea* sp. with single old *Salix caprea* L. and *Alnus incana* (L.) Moench., and rarely with *Pinus sylvestris* L.) and mixed aspen-spruce (with *Populus tremula* L., *Sorbus aucuparia* L. and young *Acer platanoides* L.) or lime-spruce (with *Tilia cordata* L.) forest communities. The detailed description of the climate, landscape, and other characteristics of the investigation area are published in our previous papers (Urbanavichene, Urbanavichus, 2019b, 2020).

The results presented in the article are based on the herbarium collected during the expedition to the Kologriv Forest Reserve in June–July 2020.

Materials and methods

The specimens were collected by the authors in the northern, middle and southern parts of the Kologrivsky cluster of the Kologriv Forest Reserve (Kologriv District, Kostroma Region) in the summer of 2020. The geographic coordinates (WGS84) of each locality were measured by GPS. Morphological and microscopic characters were examined by standard microscopic techniques. Polarized light (pol) was used for locating crystals in the sections. Lichen substances of some species were studied by spot-tests using potassium hydroxide solution (K), sodium hypochlorite solution (C), 1,4-p-phenylendiamine (Pd), and iodine (I), and by a thin-layer chromatography (TLC) in solvent systems A and C (Orange et al., 2001). The nomenclature of the cited taxa follows Nordin et al. (2011) and the borders of Middle Russia are indicated according to Mayevskiy (2014). The specimens are deposited in the private herbarium of G. P. Urbanavichus and in the lichen herbarium of Komarov Botanical Institute (LE), duplicates are in the herbariums of the Altai State University (ALTB). In the following list of species, lichenicolous fungi are marked with * and non-lichenized fungi are marked with +.

Results

The list of species

Acarospora moenium (Vain.) Räsänen: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 17, neighborhood of the Sekha cordon, old-growth mixed forest, 58°55′34.3″N, 43°49′48.5″E, on old concrete slab. 06 VII 2020. G. P. Urbanavichus" (hb. G. U. Urbanavichus, ALTB). – Inconspicuous lichen, widespread on man-made substrate (concrete, etc.), more rarely on calciferous schists. Distribution in neighboring territories: Yaroslavl and Vologda Regions (Muchnik et al., 2009), Nizhniy Novgorod Region (Urbanavichus, Urbanavichene, 2004).

Acrocordia cavata (Ach.) R. C. Harris: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 89, left bank of the nameless stream (left tributary of the Nelka River), dark coniferous forest with *Populus tremula* and singles young trees of *Acer platanoides*, 58°45′06.5″N, 43°53′50.2″E, on the bark of *Acer platanoides*. 29 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (ALTB). – Unreported from neighboring territories. The nearest localities in the Middle Russia (sensu Mayevskiy, 2014) were previously known from the Tver Region (Notov et al., 2011), Bryansk Region (Muchnik, 2020). The specialized species of biologically valuable old-growth forests in North-Western European Russia (Survey of biologically ..., 2009).

Allocalicium adaequatum (Nyl.) M. Prieto et Wedin: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 90, neighborhood of the Nelka place, secondary mixed forest with singles old *Salix caprea*, 58°44′57.8″N, 43°53′57.6″E, on the bark of *Salix caprea*. 28 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (ALTB). – Unreported from neighboring territories. New species for the Middle Russia. The nearest localities in European Russia are known from the southern parts of the Komi Republic (Pystina, 2003)

and the Republic of Karelia (Fadeeva et al., 2007). In Russia it was reported from the North European part, North Ural, Caucasus, Siberia and Far East (Urbanavichus, 2010).

Arthothelium spectabile Flot. ex A. Massal.: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 90, left bank of the Nelka River, dark coniferous forest with singles *Populus tremula*, *Alnus incana* and *Tilia cordata*, 58°44′50.1″N, 43°53′57.3″E, on the bark of *Tilia cordata.* 29 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus). – Unreported from neighboring territories. In the Middle Russia it was previously known from the Voronezh Region (Muchnik, 1991) and the Republic of Tatarstan (Malysheva, Smirnov, 1982).

Bacidia igniarii (Nyl.) Oxner: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 56, middle-aged spruce forest with singles *Populus tremula*, 58°50′22.0″N, 43°47′45.4″E, on the bark of *Salix caprea*. 30 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. ALTB). – Distribution in neighboring territories: Nizhniy Novgorod Region (Urbanavichus, Urbanavichene, 2004).

Biatoridium monasteriense J. Lahm ex Körb.: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 82, old elm trees in the Kosul'nikov place, 58°45′59.0″N, 43°54′26.7″E, on the bark of *Ulmus* sp. 28 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus, ALTB). – Distribution in neighboring territories: Yaroslavl Region (Muchnik et al., 2009), Nizhniy Novgorod Region (Urbanavichene, Urbanavichus, 2021). Specialized species of biologically valuable old-growth forests in North-Western European Russia (Survey of biologically ..., 2009).

Bryoria glabra (Motyka) Brodo et D. Hawksw.: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 6, old-growth swampy pine forest, 58°58′08.5″N, 43°50′03.3″E, on the bark of *Pinus sylvestris*. 02 VII 2020. I. N. Urbanavichene, G. P. Urbanavichus" (LE L15434). – Unreported from neighboring territories. New species for the Middle Russia. In the European part of Russia, it was reported from the North – Arkhangelsk and Murmansk Regions (Tarasova et al., 2015; Urbanavichus, Urbanavichene, 2020).

Bryoria vrangiana (Gyeln.) Brodo et D. Hawksw.: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 25, left bank of the Londushka River, old-growth dark coniferous-deciduous forest, 58°54′35.9″N, 43°53′53.0″E, on the bark of *Sorbus aucuparia*. 27 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus, LE L15435); "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 89, left bank of the nameless stream (left tributary of the Nelka River), dark coniferous forest with *Populus tremula*, 58°45′06.5″N, 43°53′50.2″E, on the brunches of *Picea* sp. 29 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus); "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 56, reed-sphagnum spruce forest on the right bank of the nameless stream (left tributary of the Sekha River), 58°50′03.6″N, 43°47′46.4″E, on the brunches of *Picea* sp. 30 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus, ALTB); "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 6, old-growth swampy pine forest, 58°58′08.5″N, 43°50′03.3″E, on the bark of *Pinus sylvestris*. 02 VII 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus). – Distribution in neighboring territories: Nizhniy Novgorod Region (Urbanavichene, Urbanavichus, 2021). In the Middle Russia, it was reported also from Moscow and Smolensk Regions (Chernyadeva et al., 2018; Muchnik, Tikhonova, 2020).

Candelariella efflorescens R. C. Harris et W. R. Buck: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 82, old elm trees in the Kosul'nikov place, 58°45′59.0″N, 43°54′26.7″E, on the bark of *Ulmus* sp. 28 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus, ALTB). – In Kostroma Region it was previously reported from Kologriv District in 2010 (Kuznetsova, Skazina, 2010). Distribution in neighboring territories: Yaroslavl and Vologda Regions (Muchnik et al., 2009), Nizhniy Novgorod Region (Urbanavichus, Urbanavichene, 2004).

Catinaria atropurpurea (Schaer.) Vězda et Poelt: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 25, left bank of the Londushka River, old-growth dark coniferous-deciduous forest, 58°54′35.9″N, 43°53′53.0″E, on the wood of *Sorbus aucuparia*. 27 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (ALTB, LE L15436); "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 82, old elm trees in the Kosul'nikov place, 58°45′59.0″N, 43°54′26.7″E, on the bark of *Ulmus* sp. 28 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus); "Russia, Kostroma Region, Ko-

logriv District, Kologriv Forest Reserve: quarter no. 6, to N of the Roblya Brook (left tributary of the Ponga River), dark coniferous-deciduous forest, 58°58′50.3″N, 43°48′59.2″E, on the bark of *Abies sibirica*. 02 VII 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus). – Distribution in neighboring territories: Yaroslavl Region (Muchnik et al., 2007). It is the widely distributed species in the many regions of Russia (Urbanavichus, 2010).

Chaenothecopsis consociata (Nádv.) A. F. W. Schmidt: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 25, left bank of the Londushka River, old-growth dark coniferous-deciduous forest, 58°54′35.9″N, 43°53′53.0″E, on thallus of *Chaenotheca chrysocephala*, growing on the bark of *Picea* sp. 27 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (ALTB). – In the Kostroma Region it was previously reported from the Kologriv District in 2010 (Kuznetsova, Skazina, 2010). Distribution in neighboring territories: Yaroslavl Region (Muchnik et al., 2007). The indicator species of biologically valuable old-growth forests in North-Western European Russia (Survey of biologically ..., 2009).

+***Chaenothecopsis haematopus*** Tibell: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 90, neighborhood of the Nelka place, secondary mixed forest with singles old *Salix caprea*, 58°44′57.8″N, 43°53′57.6″E, on the bark of *Salix caprea*. 28 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (LE L15437). – Distribution in neighboring territories: Nizhniy Novgorod Region (Urbanavichene, Urbanavichus, 2021). In the Middle Russia, it is currently known also from the Republic of Mari El (Bogdanov, 2015). It is the rare species in Russia previously reported from the Komi Republic, Khabarovsk Territory and Sakhalin Region (Titov, 2006), and Leningrad Region (Himelbrant et al., 2013).

Coenogonium luteum (Dicks.) Kalb et Lücking: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 31, right bank of the Sekha River, old-growth mixed dark coniferous-deciduous forest, 58°53′37.0″N, 43°50′05.5″E, on the bark of *Tilia cordata*. 05 VII 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus). – Unreported from neighboring territories. In the Middle Russia, it was previously known from the Republic of Tatarstan and the Republic of Mari El (Urbanavichus, Urbanavichene, 2004), Tver Region (Notov et al., 2014).

Cryptodiscus tabularum Kirschst.: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 6, old-growth swampy pine forest, 58°58′08.5″N, 43°50′03.3″E, on dry pine wood. 02 VII 2020. I. N. Urbanavichene, G. P. Urbanavichus" (ALTB). – Unreported from neighboring territories. In the Middle Russia, it is previously known from the Republic of Mordovia (Urbanavichus, Urbanavichene, 2015); also reported from the Northern Caucasus (Urbanavichene, Urbanavichus, 2019a).

Didymocyrtis epiphyscia Ertz et Diederich: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 89, left bank of the nameless stream (left tributary of the Nelka River), dark coniferous forest with *Populus tremula*, 58°45′06.5″N, 43°53′50.2″E, on thallus of *Physcia aipolia*, growing on bark of *Populus tremula*. 29 VI 2020. G. P. Urbanavichus" (ALTB). – Unreported from neighboring territories. In the Middle Russia previously known from the Republic of Mordovia (Urbanavichus, Urbanavichene, 2015).

Fellhanera subtilis (Vězda) Diederich et Sérus.: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 31, right bank of the Sekha River, old-growth mixed dark coniferous-deciduous forest, 58°53′37.0″N, 43°50′05.5″E, on lignum of stump of *Picea* sp. 05 VII 2020. I. N. Urbanavichene, G. P. Urbanavichus" (LE L15438). – Distribution in neighboring territories: Nizhniy Novgorod Region (Presnyakova, 2001).

Gyalecta truncigena (Ach.) Hepp: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 99, the embankment slopes of the old, abandoned railway, secondary mixed forest, 58°44′35.1″N, 43°53′57.4″E, on the bark of *Populus tremula*. 28 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus, ALTB); "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 90, left bank of the Nelka River, dark coniferous forest with singles *Populus tremula*, *Alnus incana* and *Tilia cordata*, 58°44′50.1″N, 43°53′57.3″E, on the bark of *Salix caprea.* 29 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus). – Distribution in neighboring territories: Vologda and Yaroslavl Regions (Muchnik et al., 2009). The specialized species of biologically valuable old-growth forests in North-Western European Russia (Survey of biologically ..., 2009).

Inoderma byssaceum (Weigel) Gray: "Russia, Kostroma Region, Kologriv District, Kologriv For-

est Reserve: quarter no. 6, to N of the Roblya Brook (left tributary of the Ponga River), dark coniferous-deciduous forest, 58°58′50.3″N, 43°48′59.2″E, on dry spruce wood. 02 VII 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus). – Distribution in neighboring territories: Nizhniy Novgorod Region (Urbanavichus, Urbanavichene, 2004). Indicator of biologically valuable forests in the Southern Taiga of the North-Western European Russia (Survey of biologically ..., 2009).

***Intralichen christiansenii** (D. Hawksw.) D. Hawksw. et M. S. Cole: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 6, to N of the Roblya Brook (left tributary of the Ponga River), dark coniferous-deciduous forest, 58°58′50.3″N, 43°48′59.2″E, on apothecia of *Micarea denigrata*, growing on stump of *Picea* sp. 02 VII 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus). – Unreported from neighboring territories. In the Middle Russia, it was previously known from the Samara Region (Tsurykau, Korchikov, 2017).

Japewia subaurifera Muhr et Tønsberg: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 56, reed-sphagnum spruce forest on the right bank of the nameless stream (left tributary of the Sekha River), 58°50′03.6″N, 43°47′46.4″E, on the bark of *Picea* sp. 30 VI 2020. I. N. Urbanavichene" (hb. G. P. Urbanavichus). – Unreported from neighboring territories. New species for the Middle Russia. The nearest localities in the European Russia are known from the southern parts of the Komi Republic (Pystina, 2003) and the eastern part of Leningrad Region (Kuznetsova et al., 2007).

Lecanora albella (Pers.) Ach.: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 89, left bank of the nameless stream (left tributary of the Nelka River), dark coniferous forest with *Populus tremula*, 58°45′06.5″N, 43°53′50.2″E, on the bark of *Sorbus aucuparia*. 29 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (ALTB). – Distribution in neighboring territories: Yaroslavl Region (Muchnik et al., 2007), Kirov Region (Andreev, 1999), Nizhniy Novgorod Region (Presnyakova, 2001).

Lecanora intumescens (Rebent.) Rabenh.: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 82, old elm trees in the Kosul'nikov place, 58°45′59.0″N, 43°54′26.7″E, on the bark of *Ulmus* sp. 28 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus, ALTB); "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 89, left bank of the nameless stream (left tributary of the Nelka River), dark coniferous forest with *Populus tremula*, 58°45′06.5″N, 43°53′50.2″E, on bark of *Populus tremula*. 29 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus). – Distribution in neighboring territories: Ivanovo Region (Malysheva, 1986), Nizhniy Novgorod Region (Presnyakova, 2001).

Lecanora subcarpinea Szatala: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 90, neighborhood of the Nelka place, secondary mixed forest with singles old *Salix caprea*, 58°44′57.8″N, 43°53′57.6″E, on the bark of *Salix caprea*. 28 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus); "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 89, left bank of the nameless stream (left tributary of the Nelka River), dark coniferous forest with *Populus tremula*, 58°45′06.5″N, 43°53′50.2″E, on bark of *Populus tremula*. 29 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus, ALTB). – Distribution in neighboring territories: Yaroslavl Region (Muchnik et al., 2016).

***Lichenoconium lecanorae** (Japp) D. Hawksw.: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 56, left bank of the Sekha River, dark coniferous-deciduous forest, 58°50′24.4″N, 43°48′28.6″E, on apothecia of *Lecanora symmicta*, growing on the bark of *Alnus incana*. 30 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (ALTB). – Distribution in neighboring territories: Nizhniy Novgorod Region (Urbanavichene, Urbanavichus, 2021). In the Middle Russia, it is currently known also from the Samara Region (Tsurykau, Korchikov, 2017).

Lichenomphalia umbellifera (L.: Fr.) Redhead, Lutzoni, Moncalvo et Vilgalyis: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 56, left bank of the Sekha River, dark coniferous-deciduous forest, 58°50′24.4″N, 43°48′28.6″E, on old log. 30 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (LE L15439). – In the Kostroma Region, it was recorded also (by S. A. Nesterova) in August 2020 from Sudislavl' District (Ueda, 2021).

Melanelixia subargentifera (Nyl.) O. Blanco et al.: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 82, old elm trees in the Kosul'nikov place, 58°45′59.0″N, 43°54′26.7″E, on the bark of *Ulmus* sp. 28 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P.

Urbanavichus). – Distribution in neighboring territories: Ivanovo Region (Malysheva, 1986), Vologda Region (Muchnik et al., 2009), Kirov Region (Andreev, 1999), Nizhniy Novgorod Region (Presnyakova, 2001). Indicator species of biologically valuable old-growth forests in North-Western European Russia (Survey of biologically ..., 2009).

+***Melaspileella proximella*** (Nyl.) Ertz et Diederich: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 89, left bank of the nameless stream (left tributary of the Nelka River), dark coniferous forest with *Populus tremula*, 58°45′06.5″N, 43°53′50.2″E, on bark of *Populus tremula*. 29 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus, ALTB). – Distribution in neighboring territories: Yaroslavl Region (Muchnik, Konoreva, 2017). This is the second record for the Middle Russia. In Russia, it was reported from the North European part, Caucasus and Southern Siberia (Urbanavichus, 2010; Urbanavichus et al., 2020).

Micarea elachista (Körb.) Coppins et R. Sant.: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 6, to N of the Roblya Brook (left tributary of the Ponga River), dark coniferous-deciduous forest, 58°58′50.3″N, 43°48′59.2″E, on the bark of *Pinus sylvestris*. 02 VII 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus). – Distribution in neighboring territories: Yaroslavl Region (Muchnik et al., 2018), Nizhniy Novgorod Region (Presnyakova, 2001).

Micarea melanobola (Nyl.) Coppins (Fig.): "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 56, reed-sphagnum spruce forest on the right bank of the nameless stream (left tributary of the Sekha River), 58°50′03.6″N, 43°47′46.4″E, on lignum of stump of *Picea* sp. 30 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (LE L15433); "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 56, left bank of the Sekha River, dark coniferous-deciduous forest, 58°50′24.4″N, 43°48′28.6″E, on lignum of stump of *Picea* sp. 30 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus). The specimens contain micareic acid. Crystals (pol+) are present in the hymenium and thallus (soluble in K). – New for Russia. Anatomical and morphological characteristics of our specimens are in full accordance with the species description (Kantelinen et al., 2021). *M. melanobola* is characterized by a pale to dark vivid green thallus that is composed of goniocysts that often coalesce to form larger granules. Apothecia are numerous, 0.15–0.4 mm diam. and hemispherical to subglobose in shape. They are mostly dark grey to blackish, more rarely pale grey and produce the Sedifolia-grey pigment K+ violet and C+ violet in cross-sections. Ascospores are oblong-ellipsoid or obovoid, 0–1 septate and 10–11 × 3–3.5 µm. Micropycnidia (observed in our specimens) inconspicuous, immersed, almost globose, 50 µm diam.; microconidia straight, bacilliform, 5 × 0.8 µm. This species belongs to the *Micarea prasina*-group and closely related to *M. fallax* Launis et Myllys and *M. prasina* Fr. s. str. But *M. prasina* has wider and paler apothecia, its spores are slightly bigger (8–12(–14) × 3–4.5(–5) µm) and it produces crystalline granules (pol+) mostly in the epihymenium, whereas *M. melanobola* produces granules in the hymenium and thallus (Launis et al., 2019). *Micarea melanobola* differs from *M. fallax* by its dark grey to black apothecia. The species is known from southern and central Finland, central and northern Sweden and from one locality in Switzerland (Kantelinen et al., 2021).

Micarea pusilla Launis, Malíček et Myllys: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 25, left bank of the Londushka River, old-growth dark coniferous-deciduous forest, 58°54′35.9″N, 43°53′53.0″E, on lignum of stump of *Abies sibirica*. 27 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus); "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 56, right bank of the Sekha River, old-growth dark coniferous-deciduous forest, 58°50′12.8″N, 43°48′30.8″E, on lignum of stump of *Picea* sp. 29 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus); "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 56, middle-aged spruce forest with singles *Populus tremula*, 58°50′22.0″N, 43°47′45.4″E, on the bark of *Salix caprea*. 30 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus). The specimens contain methoxymicareic acid. Crystals were not detected in sections of the apothecia or of thallus studied in polarized light (pol–). – Unreported from neighboring territories. This is the second record for the Middle Russia. In the Middle Russia, it was recently reported from Bryansk Region (Muchnik, 2020). *M. pusilla* characterized by very small (up to 0.2 mm in diam.) whitish apothecia, usually very thin and membranaceous thallus and small ascospores (7–9 × 2–3 µm).

It occurs especially on wood of coniferous trees (mainly stumps of *Picea abies*) in old-growth as well as managed forests (Launis et al. 2019).

****Muellerella lichenicola*** (Sommerf. ex Fr.) D. Hawksw.: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 89, left bank of the nameless stream (left tributary of the Nelka River), dark coniferous forest with *Populus tremula*, 58°45′06.5″N, 43°53′50.2″E, on apothecia of *Melanohalea exasperata*, growing on *Populus tremula*. 29 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (ALTB). – Unreported from neighboring territories. In the Middle Russia previously known from the Samara Region (Tsurykau, Korchikov, 2017).

Mycobilimbia tetramera (De Not.) Vitik., Ahti, Kuusinen, Lommi et T. Ulvinen ex Hafellner et Türk: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 90, left bank of the Nelka River, dark coniferous forest with singles *Populus tremula*, *Alnus incana* and *Tilia cordata*, 58°44′50.1″N, 43°53′57.3″E, on the bark of *Populus tremula.* 29 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus). – Distribution in neighboring territories: Nizhniy Novgorod Region (Urbanavichus, Urbanavichene, 2004).

+***Naetrocymbe punctiformis*** (Pers.) R. C. Harris: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 31, right bank of the Sekha River, old-growth mixed dark coniferous-deciduous forest, 58°53′37.0″N, 43°50′05.5″E, on the bark of *Tilia cordata*. 05 VII 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus). – Distribution in neighboring territories: Nizhniy Novgorod Region (Urbanavichus, Urbanavichene, 2004).

Opegrapha vulgata (Ach.) Ach.: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 90, left bank of the Nelka River, dark coniferous forest with singles

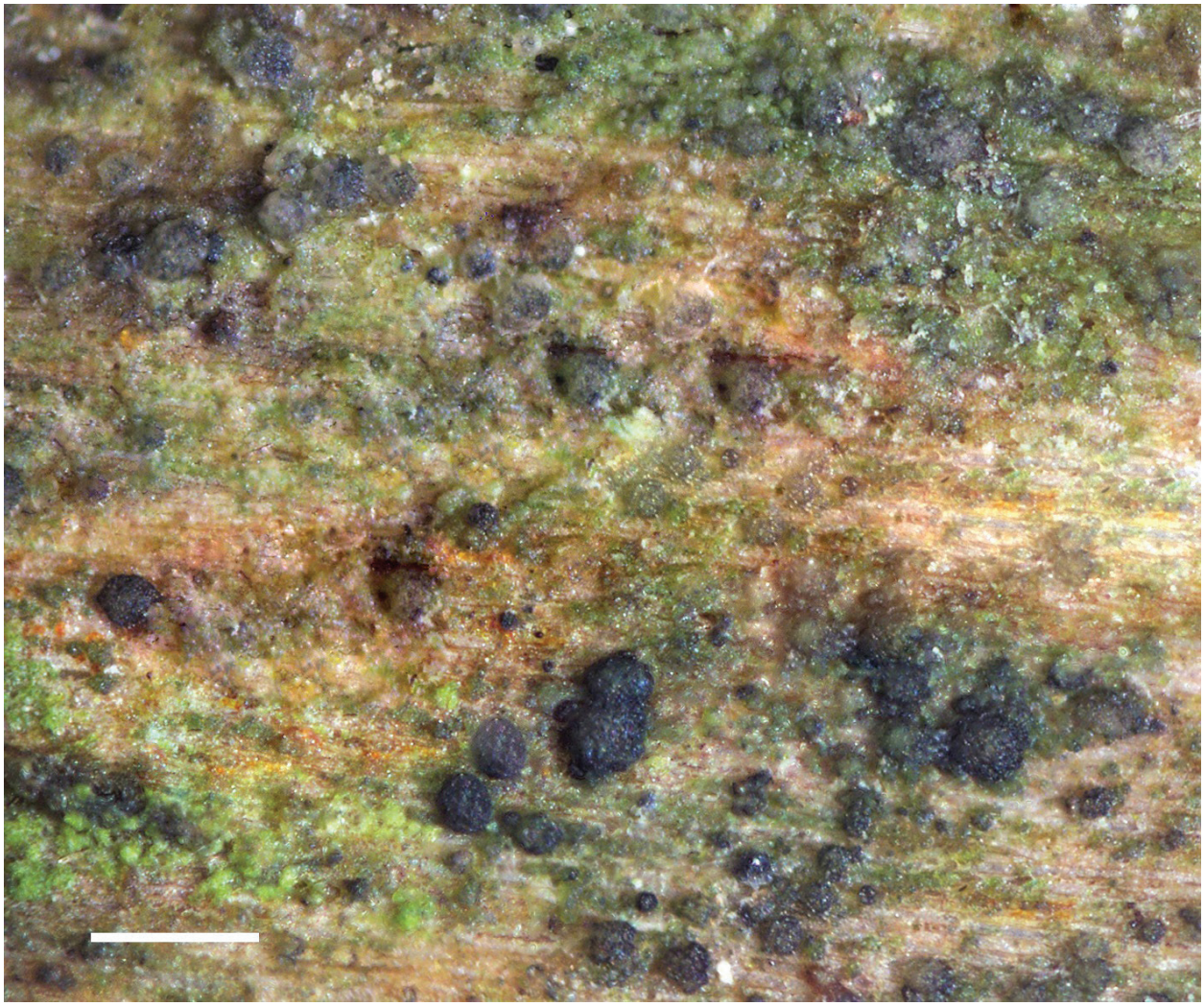

Fig. Thallus and apothecia of *Micarea melanobola* (Urbanavichus 15433, LE). Scale = 0.8 mm (Photo: I. N. Urbanavichene).

Populus tremula, *Alnus incana* and *Tilia cordata*, 58°44′50.1″N, 43°53′57.3″E, on the bark of *Tilia cordata.* 29 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus, ALTB). – Distribution in neighboring territories: Nizhniy Novgorod Region (Presnyakova, 2001).

Peltigera aphthosa (L.) Willd.: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 56, right bank of the Sekha River, old-growth dark coniferous-deciduous forest, 58°50′12.8″N, 43°48′30.8″E, on old mosses log. 29 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus). – Distribution in neighboring territories: Yaroslavl and Vologda Regions (Muchnik et al., 2009), Kirov Region (Andreev, 1999), Nizhniy Novgorod Region (Urbanavichus, Urbanavichene, 2004).

Peltigera didactyla (With.) J. R. Laundon: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 90, neighborhood of the Nelka place, secondary mixed forest with singles old *Salix caprea*, 58°44′57.8″N, 43°53′57.6″E, on old mosses log. 28 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus). – In the Kostroma Region, it was previously reported from the Kologriv District in 2010 (Kuznetsova, Skazina, 2010). It is the widely distributed species in many regions of Russia (Urbanavichus, 2010).

Peltigera horizontalis (Huds.) Baumg.: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 31, right bank of the Sekha River, old-growth mixed dark coniferous-deciduous forest, 58°53′37.0″N, 43°50′05.5″E, on the base of *Tilia cordata*. 05 VII 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus). – Distribution in neighboring territories: Ivanovo Region (Malysheva, 1986), Kirov Region (Andreev, 1999), Nizhniy Novgorod Region (Presnyakova, 2001).

+***Phaeocalicium populneum*** (Brond. ex Duby) A. F. W. Schmidt: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 89, left bank of the nameless stream (left tributary of the Nelka River), dark coniferous forest with *Populus tremula*, 58°45′06.5″N, 43°53′50.2″E, on the smooth bark of *Populus tremula*. 29 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus). – Saprophytic on thin, mostly decaying twigs of *Populus tremula*. Unreported from neighboring territories. In the Middle Russia, it was previously known from the Republic of Tatarstan (Urbanavichus, Urbanavichene, 2004), Tver Region (Notov et al., 2011).

Phaeophyscia nigricans (Flörke) Moberg: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 17, neighborhood of the Sekha cordon, old-growth mixed forest, 58°55′34.3″N, 43°49′48.5″E, on old concrete slab. 06 VII 2020. G. P. Urbanavichus" (hb. G. U. Urbanavichus). – It is common species in the Middle Russia, found on a wide variety of substrates. It is the widely distributed species in many non-arctic regions of Russia (Urbanavichus, 2010).

Phaeophyscia orbicularis (Neck.) Moberg: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 17, neighborhood of the Sekha cordon, old-growth mixed forest, 58°55′34.3″N, 43°49′48.5″E, on old concrete slab. 06 VII 2020. G. P. Urbanavichus" (hb. G. U. Urbanavichus). – It is common species in Middle Russia, found on a wide variety of substrates. It is the widely distributed species in the many regions of Russia (Urbanavichus, 2010).

Phaeophyscia pusilloides (Zahlbr.) Essl.: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 82, old elm trees in the Kosul'nikov place, 58°45′59.0″N, 43°54′26.7″E, on the bark of *Ulmus* sp. 28 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus, ALTB). – Unreported from neighboring territories. In the Middle Russia, it was previously known from the Republics of Mari El and Tatarstan (Urbanavichus, Urbanavichene, 2004), Tver (Notova et al., 2011) and Bryansk Region (Muchnik et al., 2017), the Republics of Chuvashia (Sinichkin et al., 2014) and Mordovia (Urbanavichus, Urbanavichene, 2014).

Phlyctis agelaea (Ach.) Flot.: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 25, glade to the north in the middle part of the quarter, between the road and the Londushka River, dark coniferous forest with singles old *Salix caprea* and *Populus tremula*, 58°54′20.4″N, 43°53′51.2″E, on the bark of *Sorbus aucuparia*. 27 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus). – Distribution in neighboring territories: Ivanovo Region (Malysheva, 1986), Yaroslavl Region (Muchnik et al., 2007). Indicator species of biologically valuable old-growth forests in North-Western European Russia (Survey of biologically ..., 2009).

Physcia adscendens (Fr.) H. Olivier: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 82, old elm trees in the Kosul'nikov place, 58°45′59.0″N, 43°54′26.7″E, on the

bark of *Ulmus* sp. 28 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus). – In the Kostroma Region, it was previously reported from the Kologriv District in 2010 (Kuznetsova, Skazina, 2010). It is common species in Middle Russia, found on a wide variety of substrates. It is the very widely distributed species in all regions of Russia (Urbanavichus, 2010).

Physcia caesia (Hoffm.) Fürnr.: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 17, neighborhood of the Sekha cordon, old-growth mixed forest, 58°55′34.3″N, 43°49′48.5″E, on old concrete slab. 06 VII 2020. G. P. Urbanavichus" (hb. G. U. Urbanavichus). – In the Kostroma Region, it was previously reported from the Kologriv city in 1931 (Ladyzhenskaya, 1931). In the Middle Russia, it is widespread species on man-made substrates (concrete, etc.), also on limestone or calciferous schists. It is the very widely distributed species in all regions of Russia (Urbanavichus, 2010).

Physconia enteroxantha (Nyl.) Poelt: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 82, old elm trees in the Kosul'nikov place, 58°45′59.0″N, 43°54′26.7″E, on the bark of *Ulmus* sp. 28 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus, ALTB). – In the Kostroma Region, it was previously reported from the Kologriv District in 2010 (Kuznetsova, Skazina, 2010). It is the widely distributed species in many non-arctic regions of Russia (Urbanavichus, 2010).

Physconia perisidiosa (Erichsen) Moberg: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 82, old elm trees in the Kosul'nikov place, 58°45′59.0″N, 43°54′26.7″E, on the bark of *Ulmus* sp. 28 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus, ALTB). – Distribution in neighboring territories: Kirov Region (Andreev, 1999), Nizhniy Novgorod Region (Urbanavichus, Urbanavichene, 2004).

Ramalina vogulica Vain.: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 90, neighborhood of the Nelka place, secondary mixed forest with singles of old *Salix caprea*, 58°44′57.8″N, 43°53′57.6″E, on the bark of *Salix caprea*. 28 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus, (LE L15433). – Unreported from neighboring territories. New species for the European part of Russia. This species is widely distributed in Siberia and Russian Far East (Davydov, 2004; Urbanavichus, 2010).

+***Rebentischia massalongii*** (Mont.) Sacc.: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: glades between forest quarters 37/46, secondary mixed forest along the road (coordinates were not registered), on the bark of *Alnus incana*. 28 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus). – Unreported from neighboring territories. New species for the European part of Russia. In Russia, this species was previously reported only from the Primorye Territory (Vasilyeva, 1998) and the Northern Caucasus (Urbanavichene, Urbanavichus, 2018; Urbanavichus et al., 2020).

Schismatomma pericleum (Ach.) Branth et Rostr.: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 56, left bank of the Sekha River, dark coniferous-deciduous forest, 58°50′24.4″N, 43°48′28.6″E, on the bark of *Picea* sp. 30 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus); "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 31, right bank of the Sekha River, old-growth mixed dark coniferous-deciduous forest, 58°53′37.0″N, 43°50′05.5″E, on the bark of *Tilia cordata*. 05 VII 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus, ALTB). – Distribution in neighboring territories: Nizhniy Novgorod Region (Urbanavichene, Urbanavichus, 2021). Specialized species of biologically valuable old-growth forests in North-Western European Russia (Survey of biologically ..., 2009).

**Sclerococcum simplex* D. Hawksw.: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 56, right bank of the Sekha River, old-growth dark coniferous-deciduous forest, 58°50′12.8″N, 43°48′30.8″E, in apothecia *Lepra ophthalmiza*, growing on bark of *Abies sibirica*. 29 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus, ALTB). – Unreported from neighboring territories. New species for the Middle Russia. It is rare lichenicolous species in Russia previously reported from the Komi Republic (Zhurbenko, 2004) and the Republic of Adygea (Zhurbenko, Otte, 2010).

Scoliciosporum umbrinum (Ach.) Arnold: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: glades between forest quarters 37/46, secondary mixed forest along the road (coordinates were not registered), on the bark of *Alnus incana*. 28 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus); "Russia, Kostroma Region, Kologriv District, Kologriv For-

est Reserve: quarter no. 90, neighborhood of the Nelka place, secondary mixed forest with singles of old *Salix caprea*, 58°44′57.8″N, 43°53′57.6″E, on the bark of *Salix caprea*. 28 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus). – Distribution in neighboring territories: Nizhniy Novgorod Region (Presnyakova, 2001).

Thelidium minutulum Körb.: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 99, the embankment slopes of the old abandoned railway, secondary mixed forest, 58°44′35.1″N, 43°53′57.4″E, on limestone. 28 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus, ALTB). – Distribution in neighboring territories: Yaroslavl Region (Muchnik et al., 2016).

Thelocarpon lichenicola (Fuckel) Poelt et Hafellner: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 31, right bank of the Sekha River, old-growth mixed dark coniferous-deciduous forest, 58°53′37.0″N, 43°50′05.5″E, on lignum of stump of *Picea* sp. 05 VII 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus). – Unreported from neighboring territories. In the Middle Russia, it was previously known from the Tver Region (Notov et al., 2011).

****Tremella cetrariicola*** Diederich et Coppins: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 25, left bank of the Londushka River, old-growth dark coniferous-deciduous forest, 58°54′35.9″N, 43°53′53.0″E, on thallus of *Tuckermanopsis chlorophylla*, growing on *Picea* sp. 27 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus, ALTB). – Unreported from neighboring territories. In the Middle Russia, it was previously known from the Tver Region (Notov et al., 2011).

****Tremella hypogymniae*** Diederich et M. S. Christ.: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 6, to N of the Roblya Brook (left tributary of the Ponga River), dark coniferous-deciduous forest, 58°58′50.3″N, 43°48′59.2″E, on thallus of *Hypogymnia vittata*, growing on *Picea* sp. 02 VII 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus); "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 31, right bank of the Sekha River, old-growth mixed dark coniferous-deciduous forest, 58°53′37.0″N, 43°50′05.5″E, on thallus of *Hypogymnia physodes*, growing on *Abies sibirica*. 05 VII 2020. I. N. Urbanavichene, G. P. Urbanavichus" (ALTB). – New species for the Middle Russia. In the European Territory of Russia, it was previously known from the Republic of Karelia (Fadeeva et al., 2007), Arkhangelsk Region (Tarasova et al., 2020), Komi Republic (Alstrup, 2014) and Leningrad Region (Kuznetsova et al., 2016).

Usnea perplexans Stirt.: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 90, neighborhood of the Nelka place, secondary mixed forest with singles old *Salix caprea*, 58°44′57.8″N, 43°53′57.6″E, on the bark of *Salix caprea*. 28 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus). – Distribution in neighboring territories: Yaroslavl and Vologda Regions (Muchnik et al., 2009), Nizhniy Novgorod Region (Urbanavichene, Urbanavichus, 2021).

Verrucaria dolosa Hepp: "Russia, Kostroma Region, Kologriv District, Kologriv Forest Reserve: quarter no. 99, the embankment slopes of the old abandoned railway, secondary mixed forest, 58°44′35.1″N, 43°53′57.4″E, on limestone. 28 VI 2020. I. N. Urbanavichene, G. P. Urbanavichus" (hb. G. P. Urbanavichus, ALTB). – Distribution in neighboring territories: Nizhniy Novgorod Region (Urbanavichene, Urbanavichus, 2021).

Discussion

The above list contains 44 lichen-forming, 5 non-lichenized saprobic and 8 lichenicolous fungi (altogether 57 species) which are new to the Kologriv Forest Reserve. Among these, 49 species and 17 genera (*Acrocordia, Allocalicium, Acarospora, Biatoridium, Catinaria, Cryptodiscus, Didymocyrtis, Fellhanera, Inoderma, Intralichen, Lichenoconium, Melaspileella, Rebentischia, Schismatomma, Sclerococcum, Thelidium, Tremella*) are new for the Kostroma Region. The species *Micarea melanobola* is reported for the first time for Russia. *Ramalina vogulica* and *Rebentischia massalongii* are published for the first time for the European Russia. Five species – *Allocalicium adaequatum, Bryoria glabra, Japewia subaurifera, Sclerococcum simplex, Tremella hypogymniae* are new for the Middle Russia.

The lichen flora of the Kologriv Forest Reserve turned out to be quite rich, despite the fact that indigenous forests occupy not large areas within the reserve. Besides that, the reserve forests are more important for the preservation of lichen diversity of the Kostroma Region, than the adjacent forests undergoing active deforestation. In the surveyed areas (within the reserve territory), the remnant fragments of old-growth forests in floodplains of the Sekha, Londushka, and Nelka Rivers, providing habitats

suitable for rare and indicator species included in the Red Data Book of Russia (Krasnaya kniga …, 2008) – e. g., *Leptogium burnetiae* C. W. Dodge, *Lobaria pulmonaria* (L.) Hoffm., *Menegazzia terebrata* (Hoffm.) A. Massal., *Nephromopsis laureri* (Kremp.) Kurok. (Urbanavichene, Urbanavichus, 2019b, 2020).

In consequence of this work, the lichen flora of the Kologriv Forest Reserve comprises 345 species and the Kostroma Region – 376 species (Elenkin, 1906, 1907, 1911; Ladyzhenskaya, 1931; Kuznetsova, Skazina, 2010; Himelbrant et al., 2018; Urbanavichene, Urbanavichus, 2019b, 2020). The data obtained prove a necessity of further detailed research since many species recorded have not been previously identified and reported for the European part of Russia.

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