

LICHENS FROM MANOR PARKS IN MINSK REGION (BELARUS)

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Abstract

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A total of 158 species of lichens, three lichenicolous and three non-lichenized saprobic fungi were identified in 27 old manor parks in Minsk region, Belarus. The number of lichen species per a manor park ranged from 28 to 76 species. Lichenized fungi were collected on eight substrate types, the highest number of epiphytic lichens (77 species) were found on *Tilia cordata*. Eight lichen species (*Agonimia allobata*, *Anisomeridium polypori*, *Arthonia arthonioides*, *Biatoridium monasteriense*, *Psoroglaena dictyospora*, *Reichlingia leopoldii*, *Sclerophora farinacea*, *Sclerophora peronella*) were reported for the first time from Belarus.

Keywords: lichenicolous fungi, lichenized fungi, new species, parks, Belarus.

INTRODUCTION

A small number of special scientific publications have been devoted to the survey and analysis of lichen biota in particular parks. Such data are available, e.g. for Nettlecombe Estate Park in southwest Britain (ROSE & WOLSELEY, 1984; epiphytic species only), some parks of Estonia (SANDER, 1988; epiphytic species only), parks in Pskov region, Russia (ISTOMINA & LIKHACHEVA, 2011), Palace Park and Management Park in Białowieża, eastern Poland (MATWIEJUK, 2011).

Manor parks were a traditional form of landscape design, widely used in Belarus estates in the 18th and 19th centuries (FEDORUK, 2000). Approximately 500 parks are under protection in Belarus (FEDORUK, 2000). Though the area of the historical parks have decreased due to agriculture and industry, they are still serving as refuges for corticolous lichens because of old-growth woody vegetation. So far there are few papers related to lichen diversity in Belarusian manor parks that indicate rather high lichen diversity in the parks of Minsk region (YATSYNA, 2007,

2012, 2013a, b; YATSYNA & YURCHENKO, 2013). The aim of the present research was to inventory all the data on lichenized, lichenicolous and allied fungi from the old manor parks in Minsk region.

MATERIALS AND METHODS

The study was carried out in 27 manor parks in 2006–2014. The surveyed parks are located in 14 administrative districts of Minsk region: Vilejskij dis., loc. Osejukoviči, Vjazan, Lukovec, Ljuban; Voločinskij dis., loc. Andrivonš, Novyj Dvor; Dzeržinskij dis., loc. Volma, Stankovo, Bolšie Novosëlki; Logojskij dis., loc. Logojsk; Minskij dis., loc. Sëmko, Ignatiči, Annopol, Novoe Pole; Molodečnenskij dis., loc. Berezinskoe, Yaximovščina; Smolevičskij dis., loc. Šipjany; Stolbcovskij dis., loc. Zasule, Velikij Dvor; Červenskij dis., loc. Smiloviči, Rovaniči; Nesvižskij dis., loc. Snov, Puxovičskij dis., loc. Dukora, Blon; Ūzdenskij dis., loc. Tolkačeviči, Pervomajsk; Kleckij dis., loc. Radzivillimonty. During the study, various substrates were examined: soil, wood in various stages of decomposition, bark of tree

trunks and branches, concrete and siliceous stones. A total of about 1800 specimens of lichens were collected. Lichens were identified based on standard lichenological methods: using a microscope, binocular microscope, and chemical reagents. Hand-made sections of apothecia and thalli were examined in water solution. All the voucher specimens are deposited at the Lichenological Herbarium of V.F. Kuprevich Institute of Experimental Botany (MSK-L).

INVESTIGATION AREA

The study area is characterized by temperate climate. The mean air temperature is ca. 17.5°C in July and -6.8°C in January with an annual mean of 6°C; the average precipitation is 500–600 mm per year (SHKLYAR, 1962). Manor parks are established on a complicated relief with terraces and hills, and with semi-natural and planted tree areas, alleys, solitary trees, shrubbery, grasslands and water systems (ponds, lakes, streams, dams). Though most of the parks have been modified up to now, some stone buildings from the 18th–19th centuries as well as 170–250-year-old trees have survived. The area of the parks ranges from 1 to 16 ha, some parks have the status of natural monuments (Table 1). Most of the trees are indigenous species, of which the most common are *Acer platanoides* L., *Fraxinus excelsior* L., *Quercus robur* L., *Tilia cordata* L., *Populus tremula* L., *Picea abies* (L.) Karst. and *Pinus sylvestris* L., less frequent are *Salix caprea* L., *Ulmus glabra* Huds., *Alnus glutinosa* (L.) Gaertn., *A. incana* (L.) Moench, *Betula pendula* Roth and *Sorbus aucuparia* L. Introduced trees are also found in some parks, e.g. *Populus alba* L., *Quercus rubra* L., *Populus x canadensis* Moench, *Larix decidua* Mill., *Thuja occidentalis* L. and *Pinus strobus* L. Names of the parks, conservation status, area, establishment period (FEDORUK, 2000), the presence of water bodies and the degree of built-up of the manor parks are given in Table 1.

Most manor parks are at present used for recreation and entertainment or are surrounding the areas of educational or health care institutions. Besides, some trees are whitewashed, sanitary cuttings are performed and some parks may be influenced by close-laying farms.

RESULTS AND DISCUSSION

The number of lichen species per manor park ranged from 28 to 76 (Table 1). A total of 164 species (of these 158 species of lichens, 3 lichenicolous and 3 non-lichenized saprobic fungi) were identified in manor parks in Minsk region (*Cladonia chlorophaea* s. l. and *Lepraria* spp. were counted as one species each). Eight lichen species (*Agonimia allobata*, *Anisomeridium polypori*, *Arthonia arthonioides*, *Biatoridium monasteriense*, *Psoroglaena dictyospora*, *Reichlingia leopoldii*, *Sclerophora farinacea*, *Sclerophora peronella*) were reported for the first time from Belarus. Two species listed in the Red Data Book of Belarus (*Lobaria pulmonaria* and *Chaenotheca chlorella*, both vulnerable) and three species from the preventive protection list (*Melanohalea elegantula*, *Leptogium cyanescens* and *Rhizocarpon geographicum*) were recorded during the study (KHORUŽIK, 2005). Based on the present results, three species of lichens (*Parmelina tiliacea*, *Pleurosticta acetabulum*, *Ramalina baltica*) were proposed for inclusion in the list of preventive protection in the new edition of the Red Data Book of Belarus as the species requiring attention (LC). In Belarus, such species as *Parmelina tiliacea* and *Pleurosticta acetabulum* grow on free-standing old deciduous trees in manor parks and only very rarely they are found in natural deciduous forests.

Lichens were collected from substrate of eight types, of these the largest number (139 species, or 88% of the total number) were collected from bark of trees and shrubs, 18 (11.4%) from wood, 15 (9.5%) from concrete, 11 (7%) from siliceous stones, 5 (6.3%) from iron and bricks, respectively, 2 (1.26%) from plaster and 1 (0.64%) from soil. Epiphytic lichens inhabited 28 tree species (Fig. 1).

Nineteen species of lichens were found exclusively on old trees (trunk diameter of more than 80 cm). Of these, six species (*Agonimia allobata*, *Anisomeridium polypori*, *Arthonia arthonioides*, *Biatoridium monasteriense*, *Sclerophora farinacea*, *Sclerophora peronella*) are new to Belarus. *Caloplaca virescens*, *Oxneria ulophyllodes* and *Pachyphiale fagicola* are currently known only from old manor parks in Belarus. In Minsk region, where most of the old hardwood and especially oak forests were cut, such oak-prefering species as *Calicium viride*, *Chrysothrix candelaris*, *Cliostomum corrugatum* and *Lobaria pulmonaria* are found at

Table 1. Characteristics of the studied manor parks. Degree of built-up: high – modern buildings present; low – only old buildings, contemporary with the establishment of the park. Natural monuments – *, monuments of local significance – L, monuments of national significance – N

Name of the park	Conservation status	Area, ha	Number of lichen species	Foundation time, century	The presence of ponds, rivers	Buildings
Oscjukoviči	L*	6	58	mid-19th	ponds	high
Vjazan	–	6	55	mid-19th	ponds	high
Lukovec	L	3	50	mid-19th	–	low
Ljuban	L	10	62	early 19th	ponds, river	high
Andrion	L	12	50	late 19th	river	low
Novyj Dvor	–	1	41	mid-19th	–	low
Volma	L	8	57	early 19th	ponds, river	high
Stankovo	L	14	48	mid-19th	ponds, river	high
Bol'ie Novosělki	–	6	49	mid-19th	–	high
Logojsk	L	16	71	early 19th	river, creeks	high
Sēmko	–	15	76	mid-18th	river, creeks	high
Ignatiči	L	12	75	mid-19th	creeks	high
Anapol	–	4	46	mid-19th	–	low
Novoe Pole	–	8	50	mid-19th	–	high
Berezinskoe	L	15	56	early 19th	ponds	high
Yaximovščina	–	3	45	mid-19th	ponds, river	low
Šipjany	L	7	68	late 18th	–	low
Zasule	–	3	28	late 19th	–	high
Velikij Dvor	–	4	50	late 19th	–	high
Smiloviči	L	3	32	late 19th	river	high
Rovaniči	N	10	55	early 19th	–	high
Snov	L	4	34	mid-18th	ponds	high
Dukora	–	5	47	late 18th	river	low
Blon	–	4	56	mid-19th	river	low
Tolkačeviči	–	5	46	mid-19th	ponds	low
Pervomaisk	L	5	49	early 19th	–	high
Radzivilimonty	N	12	60	late 18th	ponds	high

present almost exclusively in manor parks. However, in the southern parts of the country, where suitable forests still abound, these lichens are not infrequent.

Thus, lichen biota from manor parks in Minsk region is characterized by high species richness with rather high number of rare species, which confirms the conservation value of the studied sites.

List of species

Species nomenclature follows SANTESSON et al. (2004), BLANCO et al. (2004), and FEDORENKO et al. (2012). Substrate on which the species was recorded as well as the number of the park in which it was collected (Table 1) are provided. New to Belarus species are typed in bold, lichenicolous fungi are marked with “#”, non-lichenized saprobic fungi are marked with “+”.

Acarospora fuscata (Nyl.) Th.Fr. – on siliceous stones (10, 17).

Acrocordia gemmata (Ach.) A. Massal. – on trunks of deciduous trees (in all parks).

Agonimia allobata (Stizenb.) P. James – on trunk of *Fraxinus excelsior* (12).

Amandinea punctata (Hoffm.) Coppins et Scheid. – on trunks of deciduous and coniferous trees (in all parks).

Anaptychia ciliaris (L.) Körb. – on trunks of deciduous trees (in all parks).

Anisomeridium polypori (Ellis & Everh.) M.E. Barr – on trunk of *Fraxinus excelsior* (17).

Arthonia arthonioides (Ach.) A.L. Sm. – on trunk of *Quercus robur* (5).

Arthonia byssacea (Weigel) Almq. – on trunks of *Quercus robur* (5, 27).

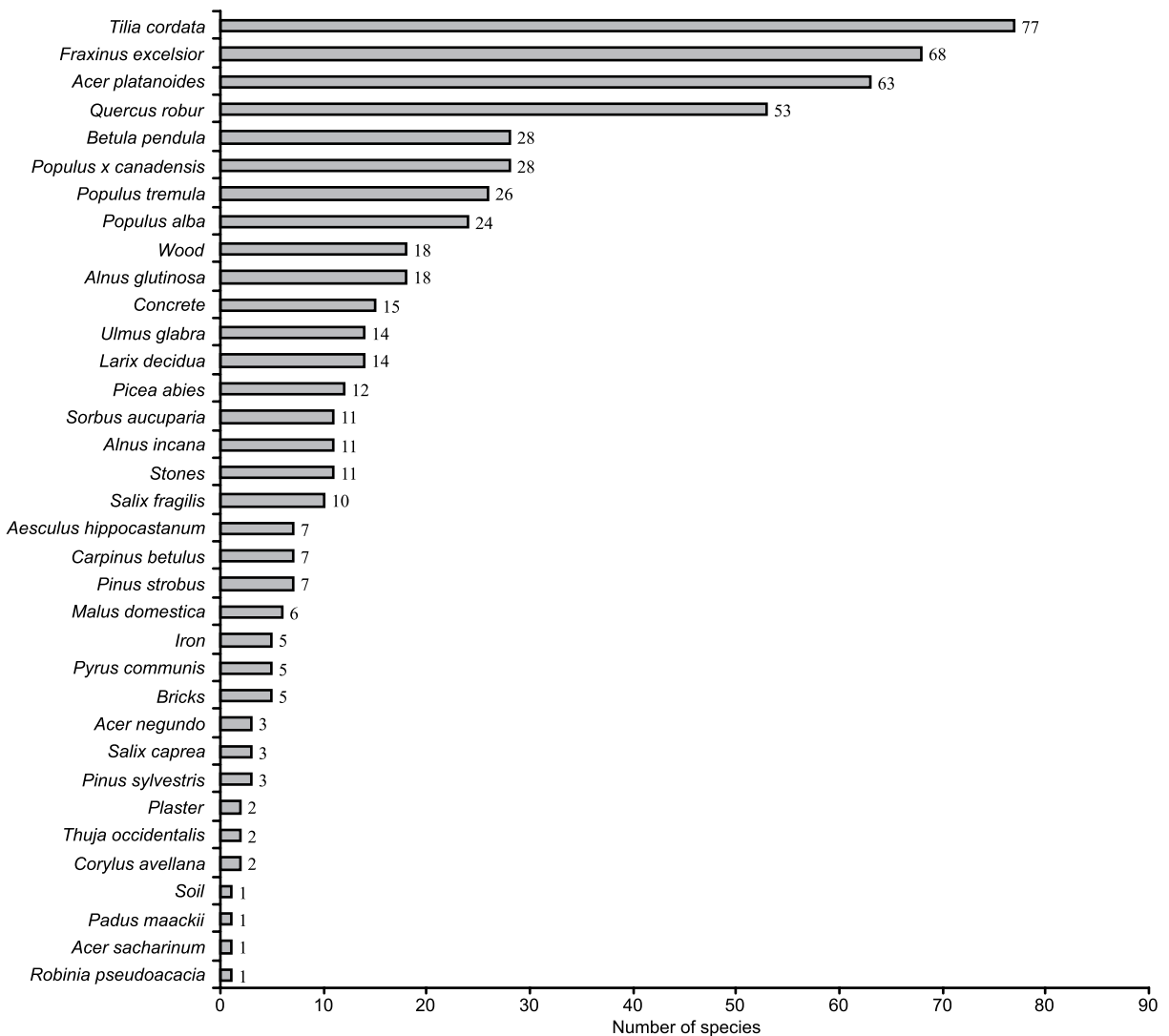


Fig. 1. Distribution of lichens on substratum of various types and phorophyte species from old manor parks in Minsk region

Arthonia cinereopruinosa Schaer. – on trunk of *Acer platanoides* (10).

Arthonia dispersa (Schrad.) Nyl. – on trunks of *Acer platanoides* (8, 11, 21).

Arthonia leucopellaea (Ach.) Almq. – on trunk of *Tilia cordata* (5).

Arthonia radiata (Pers.) Ach. – on trunks of deciduous trees (4, 5, 7, 12, 21, 25).

Arthonia ruana A.Massal. – on trunks of deciduous trees (5, 7, 11, 12, 17, 24).

Arthonia spadicea Leight. – on trunks of *Alnus glutinosa* (5, 27).

Arthrosporum populorum A.Massal. – on trunk of *Populus alba* (10).

Aspicilia cinerea (L.) Körb. – on siliceous stones (4, 17).

#*Athelia arachnoidea* (Berk.) Jülich – on thalli of *Parmelia sulcata*, *Parmelina tiliacea*, *Physconia* sp., *Pleurosticta acetabulum* (1, 5, 7, 9, 12, 15, 17, 18, 22, 25, 26).

Bacidia laurocerasi (Delise ex Duby) Zahlbr. – on trunks of *Fraxinus excelsior* (10, 11, 24).

Bacidia rubella (Hoffm.) A.Massal. – on trunks of deciduous trees (in all parks); on trunks of *Thuja occidentalis* (4).

Bacidia subincompta (Nyl.) Arnold – on trunks of deciduous trees (1, 2, 3, 5, 7, 12, 14, 21).

Bacidina arnoldiana (Körb.) V. Wirth et Vězda – on trunks of *Fraxinus excelsior* (7, 27).

- Biatoridium monasteriense* J.Lahm ex Körb. – on trunk of *Fraxinus excelsior* (17).
- Bilimbia sabuletorum* (Schreb.) Arnold – on brick wall among mosses (1, 12).
- Bryoria fuscescens* (Gyeln.) Brodo et D.Hawksw. – on trunk of *Tilia cordata* (10).
- Buellia disciformis* (Fr.) Mudd – on trunks of *Acer platanoides* (12).
- Buellia griseovirens* (Turner et Borrer ex Sm.) Almb. – on trunks of *Alnus incana* (12); on trunks of *Alnus glutinosa* (24).
- Buellia schaereri* De Not. – on trunk of *Alnus incana* (12); on wood (23).
- Calicium abietinum* Pers. – on trunk of *Quercus robur* (8).
- Calicium viride* Pers. – on trunks of *Larix decidua* (2, 7); on trunk of *Tilia cordata* (7).
- Caloplaca cerina* (Ehrh. ex Hedw.) Th.Fr. – on trunk of *Acer platanoides* (26); on trunk of *Populus tremula* (11).
- Caloplaca cerinella* (Nyl.) Flagey – on trunks of deciduous trees (1, 2, 3, 4, 5, 7, 9, 10, 11, 16, 17, 21, 23, 24, 27).
- Caloplaca citrina* (Hoffm.) Th.Fr. – on brick (10, 12, 16); on concrete (19).
- Caloplaca decipiens* (Arnold) Blomb. et Forsell – on concrete (1, 2, 7, 8, 9, 10, 11, 12, 13, 16, 17, 19, 23, 24, 26).
- Caloplaca flavovirescens* (Wulfen) Dalla Torre et Sarnth. – on small siliceous stones, the foundation of the building (8).
- Caloplaca pyracea* (Ach.) Zwackh – on trunks of deciduous trees (6, 17, 19).
- Caloplaca saxicola* (Hoffm.) Nordin – on siliceous stones (1); on concrete (2, 8, 10, 11, 12, 13, 16, 17, 23, 24).
- Caloplaca virescens* (Sm.) Coppins – on trunk of *Acer platanoides* (15).
- Candelaria concolor* (Dicks.) Stein – on trunks of *Fraxinus excelsior* (25); on trunks of *Tilia cordata* (3, 15).
- Candelaria pacifica* M.Westb. – on trunks of various deciduous trees (1, 2, 4, 8, 9, 11, 13, 16, 17, 21, 23, 26, 27); on trunks of *Larix decidua* (16).
- Candelariella vitellina* (Hoffm.) Müll.Arg. – on trunks of *Populus tremula* (4, 11).
- Candelariella xanthostigma* (Ach.) Lettau – on trunks of deciduous trees (in all parks).
- Catinaria atropurpurea* (Schaer.) Vězda et Poelt – on shed wood (5); on trunks of *Ulmus glabra* (11).
- Chaenotheca brachypoda* (Ach.) Tibell – on trunks of deciduous trees (1, 4, 5, 7, 11, 12, 15, 16, 17, 21, 25, 26, 27).
- Chaenotheca brunneola* (Ach.) Müll.Arg. – on shed wood (5).
- Chaenotheca chlorella* (Ach.) Müll.Arg. – on trunk of *Acer platanoides* (25).
- Chaenotheca ferruginea* (Turner ex Sm.) Mig. – on trunks of *Larix decidua* (2, 5, 19); on wood (6); on trunks of *Pinus sylvestris* (8, 10).
- Chaenotheca furfuracea* (L.) Tibell – on trunks of deciduous trees (1, 5, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 19, 21, 25, 27).
- Chaenotheca phaeocephala* (Turner) Th.Fr. – on trunks of deciduous trees (11, 13, 14, 15, 16, 17, 18, 21, 24, 25, 26, 27); on trunks of *Larix decidua* (5, 7, 13); on trunks of *Picea abies* (15).
- Chaenotheca stemonea* (Ach.) Müll.Arg. – on trunk of *Quercus robur* (11).
- Chaenotheca trichialis* (Ach.) Th.Fr. – on trunks of deciduous and coniferous trees (in all parks).
- Chrysothrix candelaris* (L.) J.R. Laundon – on trunks of *Quercus robur* (27).
- Cladonia chlorophaea* s.l. – on trunks of *Picea abies* (1); on trunks of *Tilia cordata* (26).
- Cladonia coniocraea* (Flörke) Spreng. – on trunks of deciduous trees (9, 10, 11, 12, 17, 20, 23); on wood (24).
- Cladonia digitata* (L.) Hoffm. – on wood (5); on trunks of *Betula pendula* (7).
- Cladonia pyxidata* (L.) Hoffm. – on trunks of deciduous and coniferous trees (2, 5, 7, 10, 11, 12, 17, 13, 21).
- Cliostomum corrugatum* (Ach.) Fr. – on trunks of *Acer platanoides* (15, 27).
- Coenogonium pineti* (Ach.) Lücking & Lumbsch – on trunks of deciduous and coniferous trees (5, 7, 11, 12, 14, 17, 24, 25, 27).
- Diplotomma alboatrum* (Hoffm.) Flot. – on trunk of *Populus tremula* (11).
- Evernia prunastri* (L.) Ach. – on trunks of deciduous and coniferous trees (in all parks).
- Fellhanera gyrophorica* Sérus. et al. – on trunk of *Acer platanoides* (17).
- Flavoparmelia caperata* (L.) Hale – on trunk of *Tilia cordata* (10); on trunk of *Carpinus betulus* (27).

- Gallowayella coppinsii* (S.Y.Kondr. et Kärnefelt) S.Y.Kondr. et al. – on trunks of deciduous trees (15, 21, 22, 27).
- Gallowayella fulva* (Hoffm.) S.Y.Kondr. et al. – on trunks of deciduous trees (6, 7, 13, 15, 16, 26).
- Graphis scripta* (L.) Ach. – on trunks of deciduous trees (1, 3, 5, 7, 10, 11, 17, 24, 25, 27).
- Hypocenomyce scalaris* (Ach. ex Lilj.) M. Choisy – on trunks of deciduous and coniferous trees (in all parks).
- Hypogymnia physodes* (L.) Nyl. – on trunks of deciduous and coniferous trees (in all parks).
- Hypogymnia tubulosa* (Schaer.) Havaas – on trunks of *Betula pendula* (14, 15, 17).
- #Illosporiosis christiansenii* (B.L.Brady & D.Hawksw.) D.Hawksw. – on thalli of *Parmelia sulcata*, *Physcia* spp., *Melanohalea exasperatula*, unidentified crustose epiphytic lichens (1, 3, 8, 9, 11, 13, 14, 15, 16, 19, 20, 21, 25, 27).
- Lecania cyrtella* (Ach.) Th.Fr. – on trunks of deciduous trees (3, 7, 10, 11, 13, 14, 15, 12, 19, 21, 22).
- Lecania erysibe* (Ach.) Mudd – on bricks (11).
- Lecania naegeli* (Hepp) Diederich et Van den Boom – on trunks of *Populus tremula* (17, 27).
- Lecania sylvestris* (Arnold) Arnold – on plaster (11).
- Lecanora allophana* Nyl. – on trunks of deciduous trees (in all parks).
- Lecanora carpinea* (L.) Vain. – on trunks of deciduous trees (in all parks).
- Lecanora chlarotera* Nyl. – on trunks of deciduous trees (2, 11, 12, 16, 21, 26).
- Lecanora conizaeoides* Nyl. ex Crombie – on trunk of *Alnus incana* (4).
- Lecanora crenulata* Hook. – on concrete (10, 11, 12, 16, 17).
- Lecanora pulicaris* (Pers.) Ach. – on trunks of deciduous trees (1, 3, 10, 11, 12, 24).
- Lecanora symmicta* (Ach.) Ach. – on trunks of deciduous trees (1, 3, 5, 7, 9, 11, 12, 14, 17, 21, 24, 26); on wood (9).
- Lecanora varia* (Hoffm.) Ach. – on wood (3, 9, 12, 17, 19, 21); on trunks of deciduous trees (15, 19, 26).
- Lecidella elaeochroma* (Ach.) M.Choisy – on trunks of deciduous trees (in all parks).
- Lepraria* spp. – on trunks of deciduous trees (in all parks).
- Leptogium cyanescens* (Pers.) Körb. – on trunk of *Tilia cordata* (11).
- Lobaria pulmonaria* (L.) Hoffm. – on trunk of *Tilia cordata* (10).
- Massjukiella candelaria* (L.) S.Y.Kondr. et al. – on trunks of deciduous trees (1, 2, 3, 6, 7, 9, 10, 11, 12, 13, 15, 19, 21, 20, 23, 24, 25, 26).
- Massjukiella polycarpa* (Hoffm.) S.Y.Kondr. et al. – on trunks of deciduous and coniferous trees (in all parks).
- Massjukiella ucrainica* (S.Y.Kondr.) S.Y.Kondr. et al. – on trunks of deciduous and coniferous trees (2, 4, 12, 13, 14, 16, 19).
- Melanelixia glabratula* (Lamy) Sandler et Arup – on trunks of deciduous trees (in all parks).
- Melanelixia glabra* (Schaer.) O.Blanco et al. – on trunks of deciduous trees (6, 12, 13, 19).
- Melanelixia subargentifera* (Nyl.) O.Blanco et al. – on trunks of deciduous trees (in all parks).
- Melanelixia subaurifera* (Nyl.) O.Blanco et al. – on branches of *Malus domestica* (5); on wood (10, 19).
- Melanohalea elegantula* (Zahlbr.) O.Blanco et al. – on trunk of *Populus alba* (16).
- Melanohalea exasperatula* (Nyl.) O.Blanco et al. – on trunks of deciduous trees (in all parks); on siliceous stones (4); on iron fence (10).
- Micarea prasina* Fr. – on wood (10).
- +*Mycocalicium subtile* (Pers.) Szatala – on wood (5).
- Opegrapha rufescens* Pers. – on trunks of deciduous trees (1, 2, 3, 4, 7, 12, 14, 24, 25).
- Opegrapha varia* Pers. – on trunks of deciduous trees (in all parks).
- Opegrapha vermicellifera* (Kunze) J.R.Laundon – on trunks of *Salix fragilis* (17).
- Oxneria huculica* S.Y.Kondr. – on trunks of deciduous trees (1, 9, 10, 19, 20, 21, 27).
- Oxneria ulophyllodes* (Räsänen) S.Y.Kondr. et Kärnefelt – on trunks of *Populus x canadensis* (22, 27).
- Pachyphiale fagicola* (Hepp) Zwackh – on trunk of *Acer platanoides* (17).
- Parmelia serrana* A.Crespo et al. – on trunk of *Tilia cordata* (14).
- Parmelia sulcata* Taylor – on trunks of deciduous and coniferous trees (in all parks); on wood (19).
- Parmelina tiliacea* (Hoffm.) Hale – on trunks of deciduous and coniferous trees (in all parks); on iron fence (24); on shed wood (19).

- Peltigera canina* (L.) Willd. – on soil (14).
- Peltigera didactyla* (With.) J.R.Laundon – on trunk of *Salix caprea* (11).
- Peltigera praetextata* (Flörke) Vain. – on moss-covered stumps (5); on moss-covered stone (10).
- Peltigera ponojensis* Gyeln. – on wood (19).
- Pertusaria albescens* (Huds.) M. Choisy et Werner – on trunks of deciduous and coniferous trees (2, 3, 8, 10, 11, 13, 22, 25, 26).
- Pertusaria amara* (Ach.) Nyl. – on trunks of deciduous trees (in all parks).
- Pertusaria leioplaca* DC. – on trunk of *Fraxinus excelsior* (27).
- Phaeophyscia ciliata* (Hoffm.) Moberg – on trunk of *Populus tremula* (5).
- Phaeophyscia nigricans* (Flörke) Moberg – on trunks of deciduous trees (in all parks); on concrete (5, 15, 24, 26, 27).
- Phaeophyscia orbicularis* (Neck.) Moberg – on trunks of various deciduous trees (in all parks); on concrete (17); on wood (20).
- Phlyctis argena* (Ach.) Flot. – on trunks of deciduous trees (in all parks).
- Physcia adscendens* (Fr.) H.Olivier – on trunks of deciduous trees (in all parks).
- Physcia aipolia* (Ehrh. ex Humb.) Fűrnr. – on trunks of deciduous trees (1, 2, 3, 4, 8, 9, 10, 11, 13, 14, 16, 21, 22, 23, 26, 27).
- Physcia caesia* (Hoffm.) Hampe ex Fűrnr. – on siliceous stones (4, 5, 15, 16, 17, 21, 23); on wood (9, 19); on iron fence (7); on concrete (12).
- Physcia dubia* (Hoffm.) Lettau – on trunks of deciduous trees (8, 10, 12, 15, 17, 23); on trunks of *Picea abies* (7).
- Physcia stellaris* (L.) Nyl. – on trunks of deciduous trees (in all parks).
- Physcia tenella* (Scop.) DC. – on trunks of deciduous and coniferous trees (in all parks).
- Physconia detera* (Nyl.) Poelt – on trunks of deciduous trees (in all parks).
- Physconia distorta* (With.) J.R.Laundon – on trunks of deciduous trees (in all parks).
- Physconia enteroxantha* (Nyl.) Poelt – on trunks of deciduous trees (in all parks).
- Physconia grisea* (Lam.) Poelt – on trunks of deciduous trees (8, 7, 10, 12, 13, 14, 15, 16, 19, 21, 22, 24, 26, 27).
- Physconia perisidiosa* (Erichsen) Moberg – on trunks of deciduous trees (in all parks).
- Placynthiella icmalea* (Ach.) Coppins et P. James – on shed wood (9).
- Platismatia glauca* (L.) W.L.Culb. et C.F.Culb. – on trunks of *Betula pendula* (9, 14, 15).
- Pleurosticta acetabulum* (Neck.) Elix et Lumbsch – on trunks of deciduous trees (in all parks).
- Protoparmeliopsis muralis* (Schreb.) M.Choisy – on siliceous stones (4, 5, 8, 10); on concrete (12).
- Pseudevernia furfuracea* (L.) Zopf – on trunks of *Tilia cordata*, *Pinus strobus* (2), on trunks of *Picea abies* (9, 10); on trunks of *Betula pendula* (12, 14, 15); on shed wood (19).
- Pseudosagedia aenea* (Wallr.) Hafellner et Kalb – on trunk of *Acer platanoides* (15).
- Psilolechia lucida* (Ach.) M.Choisy – on concrete and bricks (11).
- Psoroglaena dictyospora* (Orange) H.Harada – on trunk of *Fraxinus excelsior* (27).
- Pyrenula nitida* (Weigel) Ach. – on trunks of deciduous trees (12, 24, 27).
- Pyrrhospora querneae* (Dicks.) Körb. – on trunk of *Larix decidua* (2); on trunk of *Tilia cordata* (11).
- Ramalina baltica* Lettau – on trunk of *Acer platanoides* (21); on trunks of *Quercus robur* (1, 2, 17).
- Ramalina farinacea* (L.) Ach. – on trunks of deciduous trees (in all parks).
- Ramalina fastigiata* (Pers.) Ach. – on trunks of deciduous trees (in all parks).
- Ramalina fraxinea* (L.) Ach. – on trunks of deciduous trees (in all parks).
- Ramalina pollinaria* (Westr.) Ach. – on trunks of deciduous trees (in all parks); on bricks (12).
- Reichlingia leopoldii* Diederich et Scheid. – on trunk of *Quercus robur* (27); on trunk of *Fraxinus excelsior* (18).
- Rhizocarpon geographicum* (L.) DC. – on siliceous stones (10).
- Rinodina pyrina* (Ach.) Arnold – on trunks of deciduous trees (3, 4, 6, 11, 12, 19, 22, 26).
- Rusavskia elegans* (Link) S.Y.Kondr. et Kärnefelt – on concrete (1, 2, 4, 6, 9, 7, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20, 23, 24, 25, 27).
- +*Sarea resiniae* (Fr.: Fr.) Kuntze – on resinous exudates of *Pinus strobus* and *Pinus sylvestris* (2, 10).
- Sclerophora farinacea* (Chevall.) Chevall. – on trunk of *Ulmus glabra* (26).

Sclerophora pallida (Pers.) Y.J.Yao et Spooner – on trunks of deciduous trees (1, 2, 4, 6, 7, 10, 15, 17, 18, 20, 21, 25, 27).

Sclerophora peronella (Ach.) Tibell – on trunk of *Populus x canadensis* (4).

Scoliciosporum chlorococcum (Graewe ex Stenh.) Vězda – on trunks of deciduous trees (4, 8, 12, 23).

Scoliciosporum umbrinum (Ach.) Arnold – on concrete (12).

+*Stenocybe pullatula* (Ach.) Stein – on branches of *Alnus incana* (12); on branches of *Alnus glutinosa* (10).

Thelidium minimum Arnold – on plaster (11).

Trapeliopsis flexuosa (Fr.) Coppins et P.James – on shed wood (9).

Tuckermanopsis chlorophylla (Willd.) Hale – on trunks of *Tilia cordata* (8); on trunks of *Betula pendula* (14).

Usnea hirta (L.) Weber ex F.H.Wigg. – on trunks of *Pinus strobus* (2); on trunks of *Betula pendula* (14).

Verrucaria muralis Ach. – on concrete (8); on bricks (11).

Verrucaria nigrescens Pers. – on concrete (1, 3, 9, 19); on bricks (16, 10).

Vulpicida pinastri (Scop.) J.-E.Mattson & M.J.Lai – on trunks of *Betula pendula* (10).

Xanthoparmelia conspersa (Ehrh. ex Ach.) Hale – on siliceous stones (4, 10, 17, 21, 25).

Xanthoparmelia pulla (Ach.) O.Blanco et al. – on siliceous stones (21).

Xanthoria parietina (L.) Beltr. – on trunks of deciduous trees (in all parks).

Xanthoria polessica S.Y.Kondr. et A.P.Yatsyna – on trunk of *Tilia cordata* (14).

#*Xanthoriicola physciae* (Kalchbr.) D. Hawksw. – on thalli and apothecia of *Xanthoria parietina* (8, 12, 24).

Notes on the species new to Belarus

Agonimia allobata grows on broad-leaved trees (*Quercus*, *Ulmus*, etc.) in sheltered old woodlands (PURVIS et al., 1992). It is known from the neighbouring to Belarus countries: Poland (FALTYNOWICZ, 2003), Lithuania (MOTIEJŪNAITĖ, 2007) and the Ukraine (KONDRATYUK et al., 1996).

Anisomeridium polypori is rarely recorded in Eastern and East-Central Europe, though com-

mon throughout the western part of the continent (CZYŻEWSKA et al., 2004). This species is also reported from the neighbouring to Belarus countries: Poland (FALTYNOWICZ, 2003), Lithuania (MOTIEJŪNAITĖ, 1999) and the Ukraine (COPPINS et al., 2005).

According to WIRTH (1995), *Arthonia arthonioides* occurs at montane sites on radiation- and wind-protected overhanging surfaces on silicate rock, commonly also on bark of fir (and wood) in old near-natural forests, on cool-oceanic, very humid or high rainfall habitats. The lichen was found in neighbouring to Belarus countries: Poland (FALTYNOWICZ, 1993) and Lithuania (MOTIEJŪNAITĖ et al., 2004).

Biatoridium monasteriense is characterized by pale, cream apothecia, a green, minutely areolate thallus, and grows in shady and damp places on neutral bark of broadleaved trees, usually in crevices in the bark, in sheltered ancient woodland habitats, often in stream valleys (ŁUBEK, 2012). Possibly *B. monasteriense*, as other stenotopic species, belongs to a group of lichens, which are indicators of the ecological continuity of primeval forests (ŁUBEK, 2012). It is recorded in most of neighbouring to Belarus countries: Lithuania (MOTIEJŪNAITĖ, 1999), Poland (ŁUBEK, 2012), the Ukraine (KONDRATYUK et al., 1996). *Biatoridium monasteriense* is known from two localities in Belarus so far (second locality is in Braslav Lakes National Park, Braslav district).

Psoroglaena dictyospora differs from the other species of the genus in its submuriform ascospores, while the others have transversely septate ascospores. Of the neighbouring to Belarus countries, it is known in Poland (KUBIAK, 2013) and the Ukraine (ZELENKO, 2000).

Reichlingia leopoldii Diederich & Scheid. was first described as a lichenicolous fungus (DIEDERICH & SCHEIDEGGER, 1996), but appears to be hyphomycetous *Trentepohlia* containing lichen. It is recorded in most of the neighbouring to Belarus countries: Poland (KUKWA, 2004; MOTIEJŪNAITĖ & CZYŻEWSKA, 2008) and Lithuania (MOTIEJŪNAITĖ, 2009).

Sclerophora farinacea is found from the southern Scandinavia to Central Europe (POELT & VĚZDA, 1981). It is recorded in most of the neighbouring to Belarus countries: Poland (FALTYNOWICZ, 1993), Lithuania (CZYŻEWSKA et al., 2004) and the Ukraine (KONDRATYUK et al., 1996).

Sclerophora peronella grows in natural deciduous and mixed forests. A stable microclimate of virgin

forests and the availability of old trees are the main factors for the occurrence of this species. The rare species follows the distribution of temperate deciduous forests and is reported in the southern and western Scandinavia, Central Europe, the mountains of Southern Europe, Great Britain and North America (WIRTH, 1995). *Sclerophora peronella* occurs preferably on wood and old bark of deciduous trees in humid, shaded localities. The presence of *Sclerophora peronella* (as well as other species of the order of calicioid lichens) may be used as an indicator of the ecological continuity of forest habitat (TIBELL, 1992). This lichen is known from the neighbouring to Belarus countries: Poland (FALTYNOWICZ, 1993), Lithuania (CZYŻEWSKA et al., 2004) and the Ukraine (KONDRATYUK et al., 1996).

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REFERENCES

- BLANCO O., CRESPO A., DIVAKAR P.K., ESSLINGER T.L., HAWKSWORTH D.L., LUMBSCH H.T., 2004: *Melanelixia* and *Melanohalea*, two new genera segregated from *Melanelia* (*Parmeliaceae*) based on molecular and morphological data. – *Mycological Research*, 108: 873–884.
- COPPINS B.J., KONDRATYUK S.YA., KHODOSOVTSSEV A. YE., ZELENKO S.D., WOLSELEY P.A., 2005: Contribution to lichen flora of Ukrainian Carpathians. – *Chornomorski Botanical Journal*, 1(2): 5–23.
- CZYŻEWSKA K., MOTIEJŪNAITĖ J., CIEŚLIŃSKI S., 2004: New and noteworthy species of lichens and allied fungi from North-Eastern Poland. – *Acta Mycologica*, 40(2): 277–291.
- DIEDERICH P., SCHEIDEGGER C., 1996: *Reichlingia leopoldii* gen. nov. et sp. nov. a new lichenicolous hyphomycete from Central Europe. – *Bulletin de la Société des Naturalistes Luxembourgeois*, 97: 3–8.
- FALTYNOWICZ W., 1993: A checklist of Polish lichen forming and lichenicolous fungi including parasitic and saprophytic fungi occurring on lichens. – *Polish Botanical Studies*, 6: 1–65.
- FALTYNOWICZ W., 2003: The lichens, lichenicolous and allied fungi of Poland. An annotated checklist. – In: MIREK Z. (ed.), *Biodiversity of Poland*, 6: 1–435. – Kraków.
- FEDORENKO N.M., STENROOS S., THELL A., KÄRNEFELT I., JOHN A. ELIX J.A., HUR J.-S., KONDRATYUK S.YA., 2012: Molecular phylogeny of xanthorioid lichens (Teloschistaceae, Ascomycota), with notes on their morphology. – *Bibliotheca Lichenologica*, 108: 45–64.
- FEDORUK A.T., 2000: *Starinnye usadby Minskogo kraja*. – Minsk.
- ISTOMINA N.B., LIKHACHEVA O.V., 2011: *Lixenobiota usadebnyx parkov Pskovskoj oblasti*. – Pskov.
- KHORUŽIK L.I. (ed.), 2005: *Krasnaja kniga Respubliki Belarus: redkie i naxodjaščiesja pod ugroznoj iščeznovenija vidy dikorastuščix rastenij*. – Minsk.
- KONDRATYUK S., NAVROTSKAYA I., KHODOSOVTSSEV A., SOLONINA O., 1996: Checklist of Ukrainian lichens. – *Boccone*, 6: 217–294.
- KUBIAK D., 2013: The significance of old-growth forests in maintaining lichen diversity – an example from the remnants of the Mazovian Forest. – *Leśne Prace Badawcze*, 74(3): 245–255.
- KUKWA M., 2004: New or interesting records of lichenicolous fungi from Poland. Part II. Species mainly from northern Poland. – *Herzogia*, 17: 67–75.
- ŁUBEK A., 2012: Distribution and ecology of *Biatoridium monasteriense* J. Lahm ex Korb in Poland. – *Acta Societatis Botanicorum Poloniae*, 8(1): 29–32.
- MATWIEJUK A., 2011: Anthropogenic changes of lichen biota of the Białowieża town (Podlasie, eastern Poland). – *Botanika – Steciana*, 15: 129–138.
- MOTIEJŪNAITĖ J., 1999: Checklist of lichens and allied fungi of Lithuania. – *Botanica Lithuanica*, 5(3): 251–269.
- MOTIEJŪNAITĖ J., CZYŻEWSKA K., CIEŚLIŃSKI S., 2004: Lichens – indicators of old-growth forests in biocentres of Lithuania and north-east Poland. – *Botanica Lithuanica*, 10(1): 59–74.

- MOTIEJŪNAITĖ J., 2007: Lichenized, lichenicolous and allied fungi of Žemaitija National Park (Lithuania). – *Herzogia*, 20: 179–188.
- MOTIEJŪNAITĖ J., 2009: Lichens and allied fungi of two Regional Parks in Vilnius area (Lithuania). – *Acta Mycologica*, 44(2): 185–199.
- MOTIEJŪNAITĖ J., CZYZEWSKA K., 2008: Additions to the biota of lichens and lichenicolous fungi of Poland, with a note on *Lecania prasinoides* in eastern and central Europe. – *Polish Botanical Journal*, 53(2): 155–162.
- POELT J., VĚZDA A., 1981: Bestimmungsschlüssel europäischer Flechten. II. – *Bibliotheca Lichenologica*, 16: 1–390.
- PURVIS O.W., COPPINS B.J., HAWKSWORTH D.L., JAMES P.W., MOORE D.M. (eds), 1992: *The Lichen Flora of Great Britain and Ireland*. – London.
- ROSE F., WOLSELEY P., 1984: Nettlecombe park – its history and its epiphytic lichens: an attempt at correlation. – *Field Studies* 6: 117–148.
- SANDER E., 1988: Comparative analysis of the epiphytic lichen floras of seven rural parks in north Estonia. – In: PARMASO E., TRASS H. (eds), *Abstracts of the 11 Symposium of the Mycologists and Lichenologists of the Baltic Republics and Byelorussia*: 169–172. – Tallinn.
- SANTESSON R., MOBERG R., NORDIN A., TØNSBERG T., VITIKAINEN O., 2004: Lichen-forming and lichenicolous fungi of Fennoscandia. – Uppsala.
- SHKLYAR A.Ch., 1962: *Klimat Belarussii i selskoe hozjajstvo*. – Minsk.
- TIBELL L., 1992: Crustose lichens as indicators of forest continuity in boreal coniferous forests. – *Nordic Journal of Botany*, 12: 427–450.
- WIRTH V., 1995: *Die Flechten Baden-Württembergs*, 1–2. – Stuttgart.
- YATSYNA A.P., 2007: Lichenobiota of the park Komarovo. – In: *Proceedings of the III International Young scientists conference ‘Biodiversity. Ecology. Adaptation. Evolution’*, dedicated to anniversary from birth of famous Ukrainian lichenologist Maria Makarevych. 15–18 May 2007: 101. – Odessa.
- YATSYNA A.P., 2012: Lišajniki parka ipjany (Smolevičskij rajon, Belarus). – In: *Materialy međunarodnoj naučnopraktičeskoj konferencii ‘Problemy soxranenija biologičeskogo raznobrazija i ispolzovanija biologičeskix resursov’*. 22–26 Oktjabrja 2012: 278–281. – Minsk.
- YATSYNA A.P., 2013a: Lišajniki usadebnyx parkov centralnoj časti Minskoj oblasti (Belarus) – *Novosti Sistematiki Nizšix Rastenij*, 47: 302–309.
- YATSYNA A.P., 2013b: Lišajniki usadebnyx parkov severo-zapadnoj časti Minskoj oblasti. – *Vesnik Vicebskaga Džaržaunaga Ūniversiceta*, 5(77): 58–64.
- YATSYNA A.P., YURCHENKO E.O., 2013: Lichens of historical manor park in northwest – central Belarus. – *Vestnik Polesskogo Gosudarstvennogo Universiteta. Serija Biologičeskix Nauk*. 2: 3–11.
- ZELENO S.D., 2000: *Macentina Vězda*, a new genus for lichen flora of Ukraine (*Ascomycota, Verrucariaceae*). – In: *Abstracts of the 4th IAL Symposium*: 77. – Barcelona.

KERPĖS MINSKO REGIONO (BALTARUSIJA) DVARŲ PARKUOSE

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Santrauka

Dvidešimt septyniuose senuose Minsko regiono (Baltarusija) dvarų parkuose buvo identifikuotos 158 rūšys kerpių, trys lichenofilinių ir trys nelichenizuotų saprotrofinių grybų rūšys. Rūšių skaičius viename parke svyravo nuo 28 iki 76. Kerpės buvo renkamos nuo aštuonių substrato tipų. Didžiausias epifitinių ker-

pių rūšių skaičius (77 rūšys) aptiktas ant *Tilia cordata*. Aštuonios kerpių rūšys (*Agonimia allobata*, *Anisomeridium polyperi*, *Arthonia arthonioides*, *Biatoridium monasteriense*, *Psoroglaena dictyospora*, *Reichlingia leopoldii*, *Sclerophora farinacea*, *Sclerophora peronella*) Baltarusijoje rastos pirmą kartą.