

The lichen-forming and lichenicolous fungi of the Donetsk Upland (Ukraine)

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Abstract. A lichen survey of the Donetsk Upland (SE Ukraine) was conducted based on data collected between 2005 and 2007 and a detailed review of the literature. A total of 233 species (221 lichens and 12 lichenicolous fungi) were recorded. Five species are recorded for the first time for Ukraine: *Caloplaca raesaeneni*, *Cladonia magyarica*, *C. peziziformis*, *Endococcus rugulosus* and *Rinodina* cf. *guzzinii*. A large number of species are new records for particular biogeographic regions, including 22 species new for the plain part of Ukraine, 15 for the steppe zone of Ukraine and 145 for the Donetsk Upland. Several of the species listed here were only recently first reported for Ukraine. Some misunderstood or questionable literature records from the Donetsk Upland, such as *Caloplaca teicholyta*, *Diploschistes scruposus*, *Lecanora frustulosa*, *Rinodina exigua* and *Thrombium cretaceum*, are discussed.

Key words: biodiversity, lichen biota, lichenicolous fungi, steppe zone, Donetsk Upland

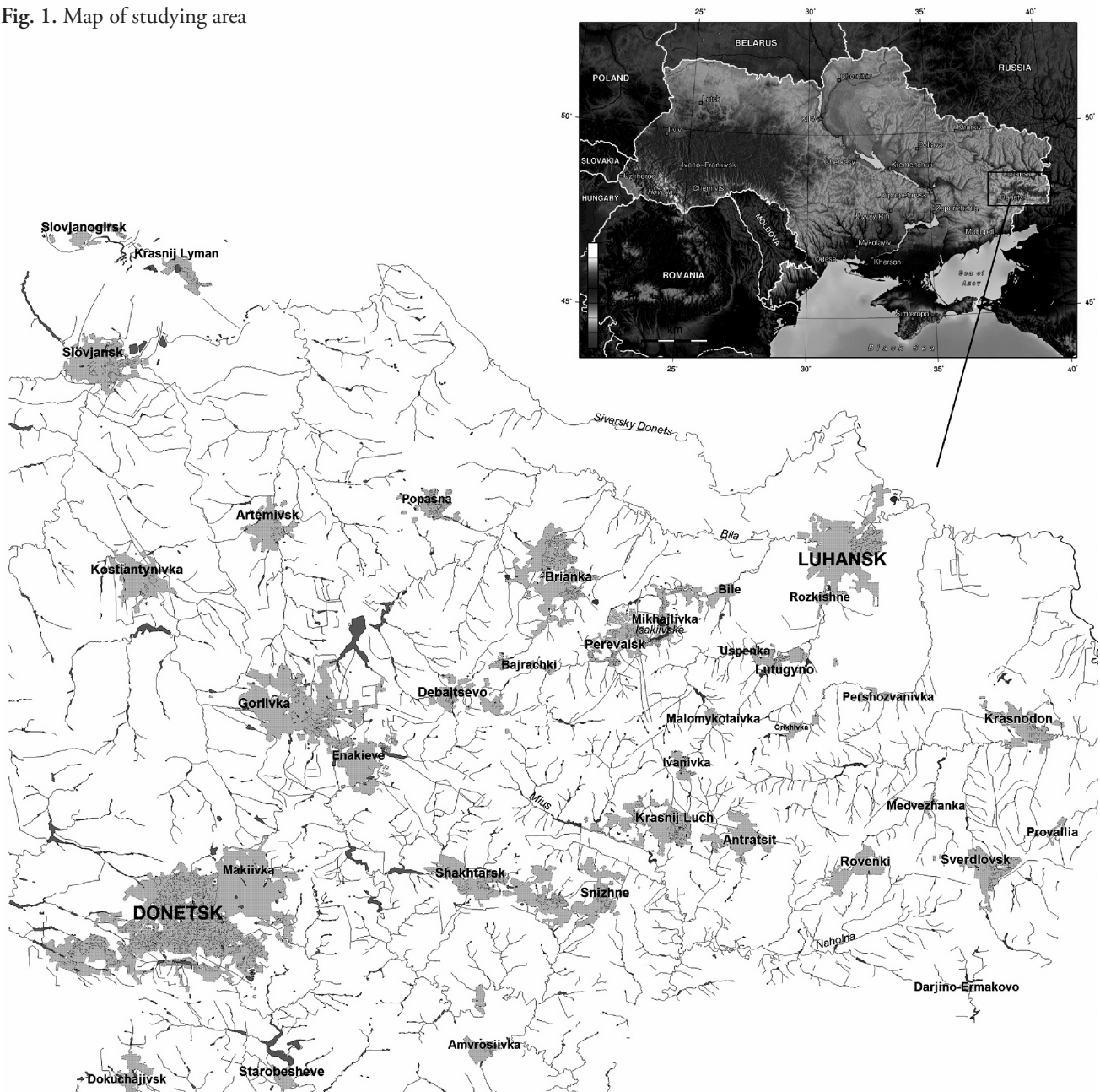
Introduction

The Donetsk Upland is situated in south-eastern Ukraine, south of Luhansk and north-east of the Donetsk region (Fig. 1). It encompasses an area of about 23 000 km². As result of small-scale stratifications in the geologic bedrock of the Donetsk Upland, there are mainly outcrops of alternating layers of Carboniferous sandstone, schist and limestone. Marl and chalk outcrops from the Cretaceous or Paleogene periods are less common and restricted to the northern boundary of the Donetsk Upland. Altitudes vary from 200 to 360 m above sea level. The typical landscape is one of valleys with steep, rocky slopes and areas between rivers with ridges and gullies, gravels and low-density rocks (Rosly 1990). The vegetation of the area belongs to two main vegetation types: 1) the Donetsk forest-steppe district of oak forests and 2) the grass-Stipeta-Festuca and petrophytic steppes of Chornomorsko-Azovska steppe subprovince of the Pontic steppe province of the Eurasian steppe area (Didukh & Sheliag-Sosonko 2003). The majority of the forests of the Donetsk Upland grow in low relief depressions and are called “bairak” forests. Those forests

occur along gullies, slopes and river valleys, but in the highest part of the Donetsk Upland forests they also grow on hilltops. These forests consist of *Quercus*, *Fraxinus*, *Ulmus*, *Tilia*, *Acer*, *Pyrus* and *Malus* (Barbarich 1977). The Donetsk Upland is one of the most disturbed areas of Ukraine with the main sources of pollution and disturbance being coal mining, heavy industry and agriculture (Galetsky 2001).

The earliest data on lichens of the Donetsk Upland area were provided by Shperk (1870), who recorded 12 epiphytic lichen species from the current area of “Sviati Gory” National Nature Park. Lichens from other areas of the Donetsk Upland were collected between 1895 and 1935 by various botanists, mainly from Kyiv, and then identified by A.M. Oxner. Oxner himself also carried out expeditions to various localities in the Donetsk Upland in 1930, 1953 and 1954, the last time together with E.G. Kopachevska. A total of 65 species of lichens were reported as a result of those investigations (Oxner 1925a, b, 1927, 1929, 1935, 1937, 1955, 1956, 1968, 1993). In particular, two species (*Thrombium cretaceum* Oxner and *Verrucaria cretophila* Oxner) were described as new for science from the Donetsk Upland (Oxner 1955) and for one species

Fig. 1. Map of studying area



(*Verrucaria squamulosocrustacea* (Savicz) Oxner) a novel taxonomic combination was proposed (Oxner 1927). Several decades followed in which there were no lichen studies in the Donets Upland until 1976, when V.R. Maslova investigated the territory of the “Provalskyi Steppe” National Reserve. Fifty-five lichens were recorded for this area, of which 30 were new for the Donets Upland (Maslova 1979). In total up to the present study, 95 lichen species had been recorded from the Donets Upland, but no data about lichenicolous fungi were available.

The aim of the present study was to complete a list of lichen-forming and lichenicolous fungi of the Donets Upland, summarizing both literature records and my own field work.

Materials and arrangement of the catalogue

Material for this study was collected in the framework of my Ph.D. program from 2005 to 2007 at a total of 134 localities in the Donets Upland (see index to localities). The list of species includes also all published literature records of lichens from the study area and some previously unpublished samples from the herbarium *KW*. Samples were collected mainly by the author (marked O.N. in the list) or other authors (indicated by the full surname). Collection numbers are given in brackets. Identification of the material was carried out at the M.H. Kholodny Institute of Botany (Kyiv, Ukraine) and in the Institute of Plant Sciences of the Karl Franzens University of Graz (Graz, Austria). All samples are

deposited in the herbarium *KW*, duplicates of some of them are deposited in *GZU*, *H* and *KHER* as indicated (hereafter abbreviated as dupl). Light and dissecting microscopes were used for the morphological examination of the samples. All identifications not performed by the author are indicated. Thin layer chromatography (TLC) was conducted on all *Lepraria* specimens and some *Cladonia* species following the protocol of Culbertson & Ammann (1979). Nomenclature follows mainly Kondratyuk *et al.* (1998, 2003) and Santesson *et al.* (2004).

Species new for the Donetsk Upland are marked by a single asterisk (*), those new for the plain part of Ukraine by two asterisks (**), those new for the Ukrainian Steppe area by three asterisks (***) and those new for Ukraine by the number symbol (#). Literature records which could not be confirmed by vouchers are marked by brackets (Ⓛ), those misreported for the Donetsk Upland are listed separately. Comments are provided on species new for Ukraine or otherwise rare or interesting (e.g., distribution in other parts of Ukraine and elsewhere; in some cases comments relating to their taxonomy). The substrate preference of each species is indicated and refers to the substrate or group of substrates where a given species was recorded most often in the Donetsk Upland (the only exception being unconfirmed literature records). The main lichen substrates in the Donetsk Upland are sandstones (hereafter abbreviated as sandst), schists and marls (silicate, carbonate, silicate-carbonate — as abbreviated to sil, carb, and sil-carb, respectively), limestones (limest), chalk, claystone, bark, wood, woody stems of grasses and steppe shrubs, soil, mosses and detritus.

Index to localities (for all localities — UKRAINE, DONETSK UPLAND)

LUHANSK REGION: [1] Locality and collector are not indicated; [2] Luhansk, 1929, S.O. Posrygan; [3] Luhansk, left bank of Luhan River valley, marl pit, 1925, E.M. Lavrenko; [4] Velyka Vergunka village near Luhansk, 1925, M.M. Pidoplichko; [5] Limestone outcrops between Vergunka and Raevka villages, 1925, M.M. Pidoplichko; [6] Schist outcrop in vicinity of Rovenki town, 1925, E.M. Lavrenko; [7] Vicinity of Novoivanivka village, 1954, A.M. Oxner & E.G. Kopachevska; [8] Limestone outcrops in vicinity of Politrivka village, 1925, M.M. Pidoplichko; [9] Rock outcrops between Sheglivka and Bile villages, 1925, M.M. Pidoplichko; [10] Sandstone outcrops between Sheglivka and Politrivka villages, 1925, M.M. Pidoplichko; [11] Claystone outcrops between Sheglivka and Troitske villages, 1925, M.M. Pidoplichko; **Anratsit District:** [12] “Nagolnyi kriazh, on the right bank of river”, M.I. Kotov; [13] Schist outcrops N of Malomykolaivka village, 1953, A.M. Oxner; [14] Vicinity of Malomykolaivka village, “Pasishna balka” gorge, 1953, A.M. Oxner; [15] Steppe slopes with rock outcrops and small forests in the bottom of gullies, 0.5 km NW of Malomykolaivka village, 6 May 2005,

O.N. (28–34); **Krasnodon District:** [16] Vicinity of Ivanivka village, 1929, S.O. Posrygan; [17] Ivanivka village, I.I. Zoz; [18] Sandstones 6 km E of Krasnodon, 1954, A.M. Oxner & E.G. Kopachevska; [19] Forest and limestone outcrops near Chervonyi Yar village, 1925, M.M. Pidoplichko; [20] Sandstone outcrops above Siverskyi Donets River in vicinity of Novokyivka village, 17 Aug 1925, M.M. Pidoplichko; [21] Gneis along “Berestova balka” gorge near Troitske village, 1925, A.S. Lazarenko; **Krasnyi Luch District:** [22] Vicinity of Yanovka village, steppe slope with sandstone outcrops and forest in gully with Mius River, 19 Jul 2006, O.N. (104, 105); **Lutugyno District:** [23] Vicinity of Pershozvanivka village, forest on the slope, mosses over rocks, 1936, G.F. Bachurina; [24] Steppe slopes with sandstone outcrops and small forests in the bottom of gullies, 1 km S of Karla Libknehta, 3 May 2005, O.N. (1–4); [25] Steppe slopes with sandstone and schist outcrops and solitary trees 1 km S of Volnukhino village, 7 May 2005, O.N. (35–39); [26] Steppe slopes with sandstone outcrops in vicinity of Volnukhino village, along left bank of Luhanchik River, 16 Apr 2007, M.M. Peregrym (135); [27] Steppe slopes with sandstone, schist and limestone outcrops in 0.5 km N of Verkhnia Orikhivka village, near with Pershozvanivske water-reservoir, 4 May 2005, O.N. (5–14); [28] Vicinity of Uspenka village, rocky steppes on the right bank of Olhovka River, 1925, E.M. Lavrenko; [29] Vicinity of Uspenka village, top of the right bank of Olhovka River, I.V. Savchenko; [30] Gully with steppe and forest vegetation, and rock outcrops in vicinity of Uspenka and Myrne villages, “Kryvenkyi Yar” Geological Monument, 5 May 2005, O.N. (15–27); [31] Steppe slopes with marl outcrops and small forest surrounded by agriculture fields in vicinity of Rozkishne village, “Balka Ploska” Botanical Reserve, 12 Apr 2007, O.N. (131–134); **Perevalsk District:** [32] Rock outcrops in vicinity of Troitske village, 1925, M.M. Pidoplichko; [33] Vicinity of Mikhailivka village, S-facing steppe slope, 1954, A.M. Oxner & E.G. Kopachevska; [34] Steep sandstone slope overgrown by trees, near Mikhailivka village, 9 Apr 2007, O.N. (118, 119); [35] Open steppe slope with sandstone outcrops above Isakiivske water-reservoir, between Mikhailivka and Troitske villages, 9 Apr 2007, O.N. (120); [36] Steppe slopes between Mikhailivka and Troitske villages, limestone outcrops, *Pinus* and *Acer* forest plantation, 9 Apr 2007, O.N. (121); [37] Bile village, chalk steppe slope, 1953, A.M. Oxner; [38] Steppe slopes with white marl outcrops above Urivka, Bile and Vesela Tarasivka villages, 10 Apr 2007, O.N. (122, 123); [39] Forest above Bila River between Bairachki, Sophiivka and Maloivanivka villages, 11 Apr 2007, O.N. (126, 127–129); [40] Steppe slopes between Bairachki and Sophiivka villages, near main road to Debal'tsevo, gully with sandstone, schist and limestone outcrops, 11 Apr 2007, O.N. (124, 125); [41] Steppe slope with limestone outcrops near Maloivanivka village, 11 Apr 2007, O.N. (130); **Sverdlovsk District:** [42] Sandstone outcrops 10 km N of Krasna Mogyla train station, near horse farm, 1954, A.M. Oxner & E.G. Kopachevska; [43] Vicinity of Pershotravneve village, 1954, A.M. Oxner & E.G. Kopachevska; [44] “Proval'skyi Steppe” Reserve, 1975,

V.R. Maslova; [45] Pastures in vicinity of the office of the “Proval'skyi Steppe” Reserve, 18 Jul 2005, O.N. (40); [46] Luhankyi Nature Reserve (branch “Proval'skyi Steppe”), Kalynivska area, dried solitary trees above forested gully, 18 Jul 2005, O.N. (41); [47] Luhankyi Nature Reserve (branch “Proval'skyi Steppe”), Kalynivska area, forest in the gully, 23 Jul 2005, O.N. (72–75); [48] Luhankyi Nature Reserve (branch “Proval'skyi Steppe”), Kalynivska area, steppe slopes with sandstone outcrops and pit, 23 Jul 2005, O.N. (76–79); [49] Luhankyi Nature Reserve (branch “Proval'skyi Steppe”), Kalynivska area, gully above stream, sandstone pit, 2000, L. Nezhiva; [50] Luhankyi Nature Reserve (branch “Proval'skyi Steppe”), near with Grushevska area, steppe slopes with rock outcrops and solitary trees, 20 Jul 2005, O.N. (47–49); [51] Luhankyi Nature Reserve (branch “Proval'skyi Steppe”), Grushevska area, steppe slopes with rock outcrops, 20 Jul 2005, O.N. (50–52); [52] Luhankyi Nature Reserve (branch “Proval'skyi Steppe”), Grushevska area, steppe slopes with rock outcrops near Kataral water reservoir, 20 Jul 2005, O.N. (53); [53] Steppe slopes with sandstone outcrops and solitary trees above Provallia village, 19, 21 & 22 Jul 2005, O.N. (46, 54–65); [54] “Korolivski Skeli” Geological Reserve, 1975, V.R. Maslova; [55] “Korolivski Skeli” Geological Reserve, at Cheremshino village, steppe slope with sandstone outcrops, 19 Jul 2005, O.N. (42–44); [56] “Korolivski Skeli” Geological Reserve, at Cheremshino village, bottom of steep sandstone slope with small patch of forest, 22 Jul 2005, O.N. (69, 70, 71); [57] Vicinity of Cheremshino village, small forest with rock outcrops in gully near “Korolivski Skeli” Geological Reserve, 19 & 22 Jul 2005, O.N. (45, 66–68); [58] Steep sandstone slope and its flat part in vicinity of Dar'ino-Ermakovo village, near main road “Kharkiv-Rostov”, 22 Jul 2006, O.N. (109); [59] Steppe slopes with rock outcrops above Medvezhanka village, “Vedmezhan'skyi” Botanical Reserve, 23 Jul 2006, O.N. (111); [60] Vicinity of Pavlivka village, steppe slopes with sandstone outcrops and forest in the bottom of gully, 23 Jul 2006, O.N. (110).

DONETSK REGION: [61] Locality and collector are not indicated; [62] Between Alatavuiia and Andriivske villages, 1927, A.S. Lazarenko; [63] Vicinity of Debaltsevo town, 1953, A.M. Oxner; *Artemivsk District:* [64] Dolomites on steppe slope in vicinity of Yama station, 1925, A.S. Lazarenko; *Pershotravneve District:* [65] Starodubivka village, A.S. Lazarenko; *Shakhtarsk District:* [66] Vicinity of Shahtarsk town, Chornogolovko; [67] Vicinity of Snizhne town and Andriivske village, on the right bank of Mius River, 1927, A.S. Lazarenko; [68] Claystone-like schist outcrops in Mius state forest, 1895, G.I. Tanfil'ev; [69] Vicinity of Blagodatne village, sandstone outcrops along the right bank of Mius River, M.I. Kotov & S.D. Karnaukh; [70] Vicinity of Petrivske village, steppe slopes and forest in the bottom of the gully with Sevost'anivka River, “Donetskyi Kriazh” Regional Landscape Park, 17 & 18 Apr 2006, O.N. (81–84); [71] Slopes near Petrivske village, Vicinity of “Donetskyi Kriazh” Regional Landscape Park, 18 & 20 Apr 2006, O.N. (87, 88, 100); [72] “Donetskyi Kriazh” Regional Landscape Park, steppe

slopes with sandstone outcrops in vicinity of Saurivka village, to the SE of Saur-Mogyła Monument, 19 Apr 2006, O.N. (89–93); [73] “Donetskyi Kriazh” Regional Landscape Park, small forests SE of Saur-Mogyła Monument (*Pinus*, *Betula* and *Populus* forest plantation), in vicinity of Saurivka village, 19 Apr 2006, O.N. (94); [74] Steppe slopes with sandstone outcrops and small forest in Vicinity of Saurivka village, to the SW of Saur-Mogyła Monument, “Donetskyi Kriazh” Regional Landscape Park, 17–19 Apr 2006, O.N. (80, 85–86); [75] Forest along “Balka Grabova” 10 km of Grabove village, 1954, A.M. Oxner & E.G. Kopachevska; [76] Vicinity of Grabove village, sandstone outcrops on the slope above Mius River, 1939, G.F. Bachurina; [77] Vicinity of Grabove and Andriivka villages, “Balka Grabova” Botanical Monument, 20 Apr 2006, O.N. (95); [78] Vicinity of Grabove and Andriivka villages, E of “Balka Grabova” Botanical Monument, above Mius River, 20 Apr 2006, O.N. (96); [79] Slopes with sandstone outcrops on S bank of Grabove water reservoir, 20 Apr 2006, O.N. (97, 98); [80] Vicinity of Dmytrivka village, schist outcrops along Mius River, M.I. Kotov, S.D. Karnaukh & G.O. Kuznetsova; [81] W of Dmytrivka village, small forest in gully bottom, 21 Apr 2006, O.N. (101); [82] E of Latyshevo village, steep and flat parts of sandstone slope and flat, 21 Apr 2006, O.N. (102, 103); [83] Vicinity of Kontarne village, steppe slopes with sandstone and schist outcrops, 20 Jul 2006, O.N. (107, 108); *Slov'iansk District (all localities belong to “Sviati Gory” National Nature Park):* [84] Sviati Gory, 1869, G.F. Shperk; [85] Teplynske state forest, near Bogorodychne village, chalk slope, 1930, A.M. Oxner; [86] Bogorodychne village and forest covering Sviati Gory, 1930, A.M. Oxner; [87] Vicinity of Bogorodychne village, 40th section of Teplynske state forest, on *Quercus*, 1930, A.M. Oxner; [88] Bogorodytske state forest, 1930, A.M. Oxner; [89] Teplynske state forest, near Bogorodychne village, chalk slope above the Siverskyi Donets River, 1954, A.M. Oxner & E.G. Kopachevska; [90] Maiatske state forest, 1954, A.M. Oxner & E.G. Kopachevska; [91] Sviati Gory (Gory Artema, Artem's Mountain), on chalk outcrops, F. Gryn & D. Dobrochaeva; [92] Maiaki village, Maiatske state forest, F. Gryn & D. Dobrochaeva; [93] Sviati Gory, on limestone wall of the “Chalk Church”, 1925, A.S. Lazarenko; [94] Vicinity of Krasnyi Liman town, on sands in pine forest, 1923, E.M. Lavrenko; [95] Sviatogir'ske state forest, Bankiv'skyi forest cottage, dry pine forest, 1927, M. Druchenko; [96] Oak forest along left bank of the Siverskyi Donets River, in direction to Bogorodychne village, 27 Jul 2006, O.N. (112, 113); [97] Artem's Mountain, winding road to Artem's Monument, dense chalk, 28 Jul 2006, O.N. (114); [98] Oak-pine forest along right bank of Siverskyi Donets River, between Lavra (Monastery) and Bogorodychne village, 28 Jul 2006, O.N. (115); [99] Steppe slopes with chalk outcrops and solitary *Robinia pseudacacia* trees in vicinity of Bogorodychne village, 28 Jul 2006, O.N. (116); [100] Maiatske state forest, forest with *Quercus*, *Ulmus*, *Fraxinus*, *Acer* and *Tilia* on the 661–664 km of the “Kharkiv-Rostov” main road, 29 Jul 2006, O.N. (117).

List of species

- **Acarospora badiofusca*** (Nyl.) Th. Fr. — sil sandst — 15; 30; 34; 35; 53; 82. In Ukraine, the species is also known from the Carpathians (Oxner 1968; Makarevich *et al.* 1982) and the Crimea (Khdosovtsev 2004).
- Acarospora cervina*** A. Massal. — limest — 27; 32 (Oxner 1968; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998); 44 (Maslova 1979; Nadyeina 2008); 64 (Oxner 1927; Oxner 1968; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998).
- Acarospora fuscata*** (Schrad.) Th. Fr. — sil sandst — 15 (dupl in *GZU*); 22; 24; 27; 30; 32 (Oxner 1929, as *Acarospora fuscata* f. *flavescens* H. Magn.; Oxner 1968; Kondratyuk & Solonina 1990); 34; 40; 46, 51, 53 (Nadyeina 2008); 58; 60; 63 (Oxner 1968; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998); 72; 79; 82; 83.
- Acarospora glaucocarpa*** (Ach.) Körb. — limest — 41.
- ***Acarospora heppii*** (Nageli ex Hepp) Nageli ex Körb. — carb sandst — 59. In Ukraine, the species is also known from the Carpathians (Oxner 1968; Makarevich *et al.* 1982) and the Crimea (Khdosovtsev 2004).
- Acarospora oligospora*** (Nyl.) Arnold — sil sandst — 25; 27; 30; 31; 34; 35; 40; 53, 55 (Nadyeina 2008); 58; 59; 74; 82; 83.
- Acarospora veronensis*** A. Massal. — sil sandst — 15; 24; 25; 30; 44 (Maslova 1979; Nadyeina 2008); 49 (dupl in *GZU*), 52, 53 (Nadyeina 2008); 56; 58; 59; 60; 74; 82; 83.
- **Acrocordia gemmata*** (Ach.) A. Massal. — bark — 98 (Nadyeina 2007b).
- Amandinea punctata*** (Hoffm.) Coppins & Scheid. — This species occurs on a variety of substrates, but especially on bark — 15; 22; 24; 27; 30; 31; 38; 39; 44 (Maslova 1979, as *Buellia punctata* (Hoffm.) A. Massal.; Nadyeina 2008); 46, 47, 48, 50, 53, 56 (Nadyeina 2008); 58; 59; 70; 73; 74; 79; 84; 82; 84 (Shperk 1870, as *B. punctata* (Flörke) Körb.), 96, 98, 99 (Nadyeina 2007b). Kashmenskiy (1906) cited Shperk's collection of this species named *Buellia punctiformis* (Hoffm.) A. Massal.
- ***Anaptychia ciliaris*** (L.) Körb. — 44 (Maslova 1979; Nadyeina 2008 cit. Maslova's record).
- Arthonia dispersa*** (Schrad.) Nyl. — smooth bark — 81; 86 (Oxner 1956; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998; Nadyeina 2007b); 98 (Nadyeina 2007b).
- Arthonia radiata*** (Pers.) Ach. — smooth bark — 84 (Shperk 1870, as *Arthonia vulgaris* Schaer. β *radiata* Pers.; Kashmenskiy 1906; Oxner 1956; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998; Nadyeina 2007b).
- ***Arthonia varians*** (Davies) Nyl. — in apothecia of *Lecanora rupicola* — 82. In Ukraine, this species is also known from the Priazovska Upland (Nadyeina 2005) and the Crimea (Khdosovtsev 2004).
- Aspicilia caesiocinerea*** (Nyl. ex Malbr.) Arnold — sil sandst — 15; 24; 25; 27; 30; 40; 44 (Maslova 1979; Nadyeina 2008); 48, 52 (Nadyeina 2008); 55; 58; 59; 70; 74 (dupl in *GZU*); 79; 82; 83.
- Aspicilia calcarea*** (L.) Mudd — limest — 27 (dupl in *GZU*); 36; 41; 72; 74; 79; 83.
- Aspicilia cinerea*** (L.) Körb. — sil sandst — 24; 44 (Maslova 1979; Nadyeina 2008); 70; 82.
- **Aspicilia contorta*** (Hoffm.) Kremp. — carb substrates — 15; 27 (dupl in *GZU*); 30; 36; 38; 40; 41 (dupl in *GZU*); 52, 53, 55 (Nadyeina 2008); 58; 59; 71; 73; 74; 82; 83; 99 (Nadyeina 2007b).
- Aspicilia recedens*** (Taylor) Arnold — sil sandst — 44 (Maslova 1979, as *Aspicilia bohemica* Körb.; Nadyeina 2008); 71.
- Aspicilia reticulata*** Kremp. — sil sandst — 15; 22; 24; 27; 30; 35; 40; 44 (Maslova 1979; Nadyeina 2008); 45; 53; 46, 48, 51, 52, 55 (Nadyeina 2008); 60; 70 (dupl in *GZU*); 72; 82; 83.
- **Bacidia bagliettoana*** (A. Massal. & De Not.) Jatta — mosses on sandstone — 70; 71.
- **Bacidia rubella*** (Hoffm.) A. Massal. — bark — 70 (Nadyeina 2007a).
- ***Bacidina egenula*** (Nyl.) Vězda — carb marl — 31 (conf. by O. Khdosovtsev, dupl in *KHER*). In Ukraine the species is also known from the Zakarpattia and Carpathians (Oxner 1968; Makarevich *et al.* 1982; Kondratyuk *et al.* 1998, 2003).
- ***Bacidina inundata*** (Fr.) Vězda — sil & sil-carb substrates — 15; 31. In Ukraine, the species is also known from the Carpathians (Kondratyuk *et al.* 1998).
- ****Bryoria fuscescens*** (Gyeln.) Brodo & D. Hawksw. — bark — 36 (Nadyeina 2007a). In Ukraine, the species is also known from the Carpathians, the Crimea and the forest zone (Kondratyuk *et al.* 1998).
- Buellia badia*** (Fr.) A. Massal. — sil sandst — 15; 44 (Maslova 1979; Nadyeina 2008); 49, 51 (Nadyeina 2008). The species usually has a subsquamulose to squamulose thallus and is lichenicolous, mainly on thalli of *Xanthoparmelia* and *Neofuscelia*. However, samples from the Donetsk Upland have non-lobate, bullate thalli and grow directly on siliceous sandstone outcrops.
- **Caloplaca arenaria*** (Pers.) Müll. Arg. — sil sandst — 48; 52. In the Ukrainian steppe, the species is also known from the Donetsk and Odessa Regions (Kondratyuk *et al.* 1998).
- **Caloplaca aurantia*** (Pers.) J. Steiner — carb substrates — 15; 24; 27.
- **Caloplaca cerina*** (Ehrh. ex Hedw.) Th. Fr. — dry wood and wooden stems of grasses and steppe shrubs — 36; 38; 56 (Nadyeina 2008).
- ****Caloplaca cerinella*** (Nyl.) Flagey — dry bark — 25 (Nadyeina 2006a, b, 2007a); 38; 53 (Nadyeina 2008). This species has been reported before from the Ukrainian steppes, but no exact locality has ever been given (Kondratyuk *et al.* 1998).

- **Caloplaca chalybeia* (Fr.) Müll. Arg. — limest — 15; 27 (dupl in *GZU*); 36.
- ***Caloplaca chlorina* (Flot.) Sandst. — sil sandst — 15. In Ukraine, the species is also known from the Carpathians and the Crimea (Kondratyuk *et al.* 1998; Khodosovtsev 2004).
- Caloplaca citrina* (Hoffm.) Th. Fr. s.l. — carb and sil-carb substrates, wooded stem of grass — 31; 32 (Oxner 1927, as *Placodium citrinum* (Hoffm.) Hepp; Kondratyuk & Solonina 1990; Oxner 1993; Kondratyuk *et al.* 1998); 82.
- **Caloplaca concreticola* Vondrák & Khodosovtsev — carb marl — 8 & 31 (det. J. Vondrák), 32 (Oxner 1993; Kondratyuk *et al.* 1998, *KW* — misunderstood as *C. teicholyta*). Thalli of *C. concreticola* growing on natural substrate are morphologically somewhat similar to that of *C. teicholyta* and thus sterile samples deposited in *KW* were confused with this species. In 2007, I collected specimens with numerous apothecia lacking anthraquinones, which are completely different from those of *C. teicholyta*, but correspond to the recently described *Caloplaca concreticola* (Vondrák *et al.* 2008). The species is so far known from the continental areas of the Crimea, the Kherson and Mykolaiv Regions in Ukraine, Romania and Slovakia (Vondrák *et al.* 2008). Although the species has so far only been found on concrete, all the occurrences in the Donetsk Upland are on natural substrates, such as carbonate marls.
- **Caloplaca coronata* (Kremp. ex Körb.) J. Steiner — limest — 15; 24; 27; 36.
- **Caloplaca crenulatella* (Nyl.) H. Olivier — carb substrates — 15; 27; 30; 31; 35; 38; 40; 41 (dupl in *GZU*); 48; 49; 52, 53, 56 (Nadyeina 2006a, b, 2008); 49 (Nadyeina 2008); 58; 59; 70; 71; 74; 82; 83. In Ukraine, the species was recently recorded from the Crimea Mountains, the Carpathians, the steppe zone (Khodosovtsev 2001; Khodosovtsev & Postoialkin 2006) and the forest-steppe zone (Smerechinska 2005).
- Caloplaca decipiens* (Arnold) Blomb. & Forssell — carb and sil-carb substrates — 4 (Oxner 1927, as *Placodium decipiens* Arnold; Kondratyuk & Solonina 1990; Oxner 1993; Kondratyuk *et al.* 1998); 15; 18 (*KW*); 25; 31; 35; 38; 41; 56 (Nadyeina 2008); 58; 70; 83; 91 (Kondratyuk & Solonina 1990; Oxner 1993; Kondratyuk *et al.* 1998; Nadyeina 2007b); 93 (Oxner 1927, as *Placodium decipiens* Arnold; Kondratyuk & Solonina 1990; Oxner 1993; Kondratyuk *et al.* 1998; Nadyeina 2007b).
- ***Caloplaca ferrari* (Bagl.) Jatta — quartz — 27 (det. J. Vondrák). In Ukraine, this species is known from Zakarpattia (Kondratyuk *et al.* 1998, 2003), Kherson Region and Crimea Mountains (Khodosovtsev 2004, 2006).
- **Caloplaca flavocitrina* (Nyl.) H. Olivier — carb and sil-carb substrates — 15; 31; 38 (all samples det. J. Vondrák).
- Caloplaca flavorubescens* (Huds.) J. R. Laundon — 29 (Kondratyuk & Solonina 1990; Oxner 1993; Kondratyuk *et al.* 1998).
- **Caloplaca grimmiae* (Nyl.) H. Olivier — on thallus of *Candelariella vitellina* — 15; 22; 27; 35; 51, 55 (Nadyeina 2006a, b, 2008); 58; 70; 82.
- **Caloplaca inconnexa* (Nyl.) Zahlbr. — on *Aspicilia* sp. — 27, 30 (Nadyeina 2006b); 58; 83.
- **Caloplaca lobulata* (Flörke) Hellb. — bark — 25; 50, 53 (dupl in *GZU*), 56, 57 (Nadyeina 2008); 98 (Nadyeina 2007b).
- Caloplaca pyracea* (Ach.) Th. Fr. — bark and woody stems of grasses — 25; 31; 36; 38; 44 (Maslova 1979; Nadyeina 2008); 50, 53 (dupl in *GZU*), 56, 57 (Nadyeina 2008, as *C. holocarpa* (Hoffm. ex Ach.) A.E. Wade); 70; 72; 99 (Nadyeina 2007b).
- #*Caloplaca raesaenii* Bredkina — soft carb substrates — 27; 52; 56 (Nadyeina 2008); 59. This species was described as *Placodium geophilum* Räsänen from Astrakhan Region (Russia), and was combined to *Caloplaca* as a nomen novum, *C. raesaenii* (Bredkina 1986). In Ukraine, the species is known from the Donetsk Upland (Nadyeina 2006b, 2008), the Kherson, Mykolaiv, Odessa Regions and the Crimea (Khodosovtsev 2006, 2008; Kondratyuk *et al.* 2006). The species is more common in the steppe zone of Eurasia (Bredkina 1986; Khodosovtsev 2008).
- Caloplaca saxicola* (Hoffm.) Nordin — carb substrates — 15; 20; 21 (Kondratyuk & Solonina 1990; Oxner 1993; Kondratyuk *et al.* 1998); 34; 41; 64 (*KW*); 71.
- **Caloplaca soralifera* Vondrák & Hrouzek — sil-carb substrates — 25; 31; 38; 53; 55; 59; 70; 74; 82. In Ukraine, this species is also known from the Kherson, Mykolaiv and Khmelnytsk Regions and the Crimea (Khodosovtsev *et al.* 2007). The species has a rather narrow distribution in Europe (Vondrák & Hrouzek 2006).
- ***Caloplaca transcaspica* (Nyl.) Zahlbr. — carb substrates — 15; 27; 40; 52 (Nadyeina 2008); 53; 58; 59; 82; 83. In Ukraine, the species is also known from the Crimea (Khodosovtsev 2003). It is further distributed in arid regions of Central Asia (Mongolia, Tadjikistan, Kazakhstan, Iran, and Afghanistan) and southern Russia (Astrakhan Region) (Poelt & Hinteregger 1993; Khodosovtsev 2004; Kondratyuk *et al.* 2006) and Armenia (Poelt & Hinteregger 1993; Harutyunyan & Mayrhofer 2009).
- Caloplaca variabilis* (Pers.) Müll. Arg. — carb substrates — 8, 32 (Oxner 1927, as *Pyrenodesmia variabilis* (Pers.) A. Massal; Kondratyuk & Solonina 1990; Oxner 1993; Kondratyuk *et al.* 1998, *KW*); 27 (dupl in *GZU*); 36.
- **Caloplaca xerica* Poelt & Vězda — sil-carb sandst — 25; 48; 57. In Ukraine, the species is also known from the Crimea (Khodosovtsev 2002).
- Candelariella aurella* (Hoffm.) Zahlbr. — carb substrates — 15; 18 (*KW*); 25; 27; 30; 31; 34, 35; 38; 41; 48, 49, 52, 53, 56 (Nadyeina 2008); 58; 59; 70; 73; 82; 83; 85 (Kondratyuk & Solonina 1990; Oxner 1993; Kondratyuk *et al.* 1998; Nadyeina 2007b).
- **Candelariella coralliza* (Nyl.) H. Magn. — sil sandst — 15; 25; 27; 30; 52, 55 (Nadyeina 2008); 53; 57; 58; 82.

- **Candelariella oleaginescens** Rondon — sil substrates — 30; 59; 82. In Ukraine, the species is also known from the Crimea (Coppins *et al.* 2001; Khodosovtsev 2004, 2005). The species is also distributed in the Mediterranean regions and Alps (Fiol 1984; Asta *et al.* 1993; Alonso & Egea 1994; Hafellner 2001).
- Candelariella vitellina** (Hoffm.) Müll. Arg. — sil sandst — 15; 22; 24; 25; 26; 27; 30; 31 (dupl in *GZU*); 32 (Kondratyuk & Solonina 1990; Oxner 1993; Kondratyuk *et al.* 1998); 34; 35; 40; 41; 44 (Maslova 1979; Nadyeina 2008); 45, 47, 48, 52; 53, 55, 56 (Nadyeina 2008); 58, 60; 70; 74; 79; 82; 83.
- Candelariella xanthostigma** (Ach.) Lettau — bark — 15; 25; 30; 31; 32 (Oxner 1927, as *C. vitellina* (Hoffm.) Müll. Arg. f. *xanthostigma* (Pers.) Oxner; Kondratyuk & Solonina 1990); 34; 39; 44 (Maslova 1979; Nadyeina 2008); 46, 50, 53, 56; 57 (Nadyeina 2008); 70; 73; 79; 96, 100 (Nadyeina 2007b).
- **Catillaria chalybaea** (Borrer) A. Massal — 44 (Maslova 1979; Nadyeina 2008 cit. Maslova's record).
- **Cercidospora macrospora** (Uloth) Hafellner et Nav.-Ros. — on *Protoparmeliopsis muralis* s.l. — 22; 24, 25, 27 (Nadyeina 2006b, c; Fedorenko *et al.* 2007); 49, 51 (Fedorenko *et al.* 2007; Nadyeina 2008); 58. In Ukraine, the species is also known from the Crimea (Kondratyuk *et al.* 1998) and the forest and forest-steppe zones (Fedorenko *et al.* 2007).
- Cetraria steppae** (Savicz) Cogt — soil — 2, 6, 12, 33 (Roms & Blum 1988, as *Coelocaulon steppae* (Savicz) Barreno & Vazques; Kondratyuk & Solonina 1990; Oxner 1993; Kondratyuk *et al.* 1998); 22; 30; 35; 44 (Maslova 1979, as *Cornicularia steppae* Savicz; Nadyeina 2008); 45, 48, 53 (Nadyeina 2008); 58; 59 (dupl in *GZU*); 60; 62 (Kärnefelt 1986, as *Coelocaulon steppae* (Savicz) Barreno & Vazques; Kondratyuk & Solonina 1990; Oxner 1993; Kondratyuk *et al.* 1998); 70; 72; 74 (dupl in *GZU*); 82; 83.
- **Chaenotheca hispidula** (Zahlbr.) Th. Fr. — 87 (Oxner 1935; Kondratyuk & Solonina 1990; Nadyeina 2007b cit. Oxner's record).
- Chaenotheca phaeocephala** (Turner) Th. Fr. — bark crevices — 87 (Oxner 1935; Kondratyuk & Solonina 1990; Nadyeina 2007b); 100 (Nadyeina 2007b).
- *Chaenotheca trichialis** (Ach.) Th. Fr. — bark crevices — 77, 81 (Nadyeina 2007a); 98, 100 (Nadyeina 2007b).
- Chaenothecopsis pusilla** (Ach.) A.F.W. Schmidt — dry wood — 77 (Nadyeina 2007a).
- ***Chromatochlamys muscorum** (Fr.) H. Mayrhofer & Poelt — mosses — 70. Oxner (1956) stated that *C. muscorum* can be found in the Ukrainian Carpathians, and it was later recorded in the Podillia Upland (Bielczyk & Kiszka 2000). In the Donetsk Upland, *C. muscorum* is known from only a single locality, where it overgrows *Brachythecium albicans*. The species is widely distributed in Europe, the Caucasus, northern Asia, Africa and North America (e.g., Oxner 1956; Mayrhofer & Poelt 1985; Mayrhofer 1987; Boissiere & Montavont 1994; Berger & Aptroot 2002).
- **Cladonia arbuscula** (Wallr.) Flot. — 95 (Oxner 1968; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998, as *Cladonia arbuscula* (Wallr.) Hale & W.L. Culb.; Nadyeina 2007b cit. Oxner's record).
- Cladonia chlorophaea** (Flörke ex Sommerf.) Spreng. — mosses and detritus — 22; 23 (Oxner 1968; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998, as *C. pyxidata* subsp. *chlorophaea* (Flörke ex Sommerf.) V. Wirth); 30; 34; 40; 44 (Maslova 1979; Nadyeina 2008); 45; 55; 58; 70; 79; 82.
- Cladonia coniocraea** (Flörke) Spreng. — mosses and soil — 15; 22; 26; 34; 38; 44 (Maslova 1979; Nadyeina 2008); 52 (Nadyeina 2008); 53; 60; 75 (Oxner 1968; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998); 100 (Nadyeina 2007b).
- Cladonia convoluta** (Lam.) Anders — mosses and soil — 22; 32 (Oxner 1927; Oxner 1968; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998); 24; 27; 35; 45, 48, 53 (Nadyeina 2008); 60; 70; 79; 82; 83.
- Cladonia fimbriata** (L.) Fr. — mosses — 22; 24; 30; 32 (Oxner 1927, as *C. f.* var. *simplex* (Weiss) Flot.); 35; 36 (dupl in *GZU* and *H*); 38; 39; 44 (Maslova 1979; Nadyeina 2008); 48, 52 (Nadyeina 2008); 55; 58; 60; 72; 73; 85 (Oxner 1968; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998; Nadyeina 2007b).
- Cladonia foliacea** (Huds.) Willd. — soil and mosses — 15; 22; 26; 27; 30; 35 (dupl in *GZU* & *H*); 33, 42 (Oxner 1968; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998); 40; 44 (Maslova 1979; Nadyeina 2008); 45, 47, 48, 53 (Nadyeina 2008); 51 (dupl in *GZU* and *H*); 58; 60; 70; 72; 74 (dupl in *GZU* and *H*); 79; 82; 83; 94 (Oxner 1925a, as *C. foliacea* var. *alcicornis* (Lightf.) Schaer.; Oxner 1968; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998; Nadyeina 2007b).
- Cladonia furcata** (Huds.) Schrad. — soil and mosses — 15; 24; 44 (Maslova 1979; Nadyeina 2008); 48 (Nadyeina 2008); 70.
- **Cladonia gracilis** (L.) Willd. — 32 (Oxner 1968; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998 cit. Oxner's record).
- #Cladonia magyarica** Vain. — 26; 27 (dupl in *GZU* and *H*); 30; 35; 40; 70. This species differs from morphologically similar species of the *C. pyxidata* group by the presence of atranorin, long squamules and grayish podetia (Litterski & Ahti 2004). The species occurs in open and dry localities on carbonate-rich soils in regions with continental climate (Trass 1978; Farkas & Lököš 1994). *C. magyarica* used to be known only from Pannonia in Central Europe and was considered to be a regional endemic. However, it was later found in Serbia as well as in Canada and Nebraska (Litterski & Ahti 2004). Litterski & Ahti (2004) confirmed the species from Russia (Volgograd Region) and Central Asia (western Tian Shan in Kyrgyzstan). However, there are some other doubtful records of *C. magyarica*, in particular

- from Estonia (Trass 1978), China and Azerbaidjan (last records cited according to Litterski & Ahti 2004), the Central Chernozem Region of Russia and the southern Urals (Muchnik 2003; Merkulova 2006). The species is reported as new for Ukraine from the Donetsk Upland, where it is rare, mostly growing with mosses.
- *Cladonia arbuscula* subsp. *mitis* (Sandst.) Ruoss — 44 (Maslova 1979; Nadyeina 2008 cit. Maslova's record).
- * *Cladonia peziziformis* (With.) J. R. Laundon — soil — 35 (dupl in *GZU* and *H*). Syn. *C. capitata* (Michx.) Spreng., *C. leptophylla* (Ach.) Floerke, *C. leptophyllodes* Harm. This pioneer species is common in places disturbed by burning (T. Ahti, pers. comm.). The species can be easily recognized by its swollen, roundish, whitish-green squamules (1–3 mm diam.), which are solitary or aggregated in cushions (Trass 1978). The sample from the Donetsk Upland lacks podetia, having instead only primordia on a horizontal thallus. The species is common in the eastern United States, but is rare in Europe, where it occurs mainly in France. It is occasional in other parts of its range (T. Ahti, pers. comm.). Global distribution: North America (Canada, USA), Jamaica, St. Helena Island, South America (Brazil, Cuba), Europe (Czech Republic, Holland, Norway, Sweden), Polar Urals and Novaya Zemlya, Australasia (Australia, Papua New Guinea) (e.g. Tønsberg & Øvstedal 1995; Diederich 2003).
- * *Cladonia pocillum* (Ach.) Grognot — among mosses — 24; 27; 35; 45, 53 (Nadyeina 2008); 59; 70; 82; 83.
- Cladonia pyxidata* (L.) Hoffm. — mosses — 22; 26; 27; 35 (dupl in *GZU* and *H*); 40; 43 (Oxner 1968; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998); 47, 51 (Nadyeina 2008); 59; 70; 82.
- Cladonia rangiformis* Hoffm. — soil — 4 (Maslova 1979; Nadyeina 2008); 48 (Nadyeina 2008); 68 (Oxner 1925b, as *C. rangiformis* var. *muricata* (Del.) Arnold; Oxner 1968; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998).
- * *Cladonia rei* Schaer. — mosses — 30; 35; 58; 60; 70.
- *Cladonia stellaris* (Opiz) Pouzar & Vězda — 95 (Oxner 1929, as *C. alpestris* (L.) Rabenh.; Oxner 1968; Nadyeina 2007b cit. Oxner's record, *KW*).
- Cladonia subrangiformis* Sandst. — soil — 15; 24; 26; 40; 44 (Maslova 1979, as *C. furcata* subsp. *subrangiformis*; Nadyeina 2008); 46; 62; 59 (dupl in *GZU* and *H*); 70; 72; 82.
- Cladonia subulata* (L.) Weber ex F.H. Wigg. — among mosses on soil — 24; 38 (dupl in *GZU* and *H*); 44 (Maslova 1979; Nadyeina 2008); 58.
- *** *Cladonia symphyrcarpia* (Flörke) Fr. — mosses — 15 (dupl in *GZU* and *H*); 22; 24; 27 (Nadyeina 2006a, b, as *C. hungarica* (Arnold) Vain., dupl in *GZU* and *H*); 30; 35; 45 (Nadyeina 2006a, b, 2008, as *C. hungarica*); 51 (dupl in *GZU* and *H*), 53 (Nadyeina 2008, as *C. hungarica*); 70 (dupl in *GZU* and *H*); 74; 79. In Ukraine, the species is also known from the Carpathians (Kondratyuk *et al.* 1998) and the forest-steppe zone (Oxner 1968; Smerechinska 2005).
- *Cladonia uncialis* (L.) Weber ex F.H. Wigg. — 44 (Maslova 1979; Nadyeina 2008 cit. Maslova's record); 95 (Oxner 1968; Nadyeina 2007b cit. Oxner's record).
- *Cladonia verticillata* (Hoffm.) Schaer. — 44 (Maslova 1979; Nadyeina 2008 cit. Maslova's record).
- * *Collema crispum* (Huds.) Weber ex F.H. Wigg. — mosses and limest — 15, 27, 31, 41 (Nadyeina 2006b); 52 (Nadyeina 2008, named *C. tenax*); 70; 99 (Nadyeina 2007b).
- * *Collema tenax* (Sw.) Ach. em. Degel. — clay, marl, limest — 15, 27, 36, 38, 41 (Nadyeina 2006b); 58; 60; 70; 82; 99 (Nadyeina 2007b).
- *Cyphelium lucidum* (Th. Fr.) Th. Fr. — 84 (Shperk 1870 as *Acolium viridulum* De Not.). This record has been cited several times (Kashmenskyi 1906, as *Acolium lucidum* Rabenh.; Oxner 1956; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998; Nadyeina 2007b), but remains the only one for Ukraine (Kondratyuk *et al.* 1998).
- *Cyphelium tigillare* (Ach.) Ach. — 84 (Shperk 1870, as *Acolium tigillare* Ach.). This record has been cited several times (Kashmenskyi 1906, as *Acolium viridescens* (Liljeblad) Vain.; Oxner 1956; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998; Nadyeina 2007b). In Ukraine, this species is also known from the Carpathians (Kondratyuk *et al.* 1998).
- Dermatocarpon miniatum* (L.) W. Mann — carb sandst — 6 (Oxner 1936, 1956; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998); 15; 52 (Nadyeina 2008).
- * *Dimelaena oreina* (Ach.) Norman — sil sandst — 27; 35; 51 (Nadyeina 2008); 70; 74; 82; 83.
- ** *Diploschistes* cf. *euganeus* (A. Massal.) J. Steiner — sil sandst — 52 (conf. by O. Khodosovtsev). The specimen from the Donetsk Upland has a whitish pruinose thallus and a C-thallus reaction, but it cannot be assigned to *Diploschistes euganeus* with complete certainty (because it contains no spores) and requires confirmation by additional samples. After the record from Crimea (Khodosovtsev 2003), this would be the second record for Ukraine.
- * *Diploschistes muscorum* (Scop.) R. Sant. — soil — 15; 24; 27; 34; 38 (dupl in *GZU*); 45, 53 (Nadyeina 2008); 59; 70; 79.
- *Diploschistes scruposus* (Schreb.) Norman — 6, 17, 23, 65 (Oxner 1956; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998); 44 (Maslova 1979; Nadyeina 2008). Vouchers to the literature records of *D. scruposus* are absent from *KW* and the species was not confirmed during my expeditions to the Donetsk Upland. Literature records are mainly based on the work of Oxner (1956), in which the author understood "*D. scruposus*" in its broad sense. The literature records of "*D. scruposus*", which were published before the works of Piterans (1975) and Lumbsch (1989), probably consist of several *Diploschistes* species. They may refer to *D. muscorum*, which is quite common on soil in the region. *Diploschistes scruposus* is known from siliceous outcrops in the Ukrainian steppe zone (*KW*) and its occurrence on sandstone in the Donetsk Upland cannot be ruled out.

- **Diplotomma alboatrum* (Hoffm.) Flot. — sil sandst — 30; 70. Specimens from calcareous substrates could be mistaken with *D. subdispersa* or *D. venustum*. *D. alboatrum* has smaller apothecia and its thallus usually consists of scattered areoles or flat granules, while *D. venustum* has more immersed apothecia, and a thicker thallus rim and thallus. Its most distinct trait is its spores: *D. alboatrum* has straight, submuriform spores, while *D. venustum* has curved, 3-celled spores (Nordin 2000).
- ****Diplotomma venustum* Körb. — carb substrates — 49, 52 (Nadyeina 2006b, 2008, as *Buellia venusta* (Körb.) Lettau). After the record from *Podillia* (Nordin 2000), this is the second record for Ukraine.
- **Endocarpon pusillum* Hedw. — small carb rocks — 52 (Nadyeina 2008).
- ***Endococcus propinquus* (Körb.) D. Hawksw. s.l. — on *Aspicilia* sp. — 20 (KW), 51 (Nadyeina 2006b, c, 2008; Fedorenko *et al.* 2007). In Ukraine, this species has only been recorded from *Zakarpattia* by M. Servít and J. Nádvořník (Oxner 1956).
- #*Endococcus rugulosus* Nyl. s.l. — on *Aspicilia* sp. — 27 (Nadyeina 2006b, c; Fedorenko *et al.* 2007); 30; 48, 51, 53, 55 (Nadyeina 2006b, c; Fedorenko *et al.* 2007; Nadyeina 2008); 83. The species is common throughout the Donetsk Upland, growing on thalli of *Aspicilia caesiocinerea* or *A. reticulata*, often together with *Muellerella pygmaea*.
- Evernia prunastri* (L.) Ach. — bark — 15; 22; 31; 36; 44 (Maslova 1979; Nadyeina 2008); 45 (Nadyeina 2008); 60; 70; 73; 75 (Kondratyuk & Solonina 1990; Oxner 1993; Kondratyuk *et al.* 1998); 79; 85, 88, 90, 96, 98, 99 (Nadyeina 2007b).
- **Graphis scripta* (L.) Ach. — smooth bark — 98 (Nadyeina 2007b).
- **Hypocenomyce scalaris* (Ach.) M. Choisy — bark — 38; 39; 88 (Oxner 1968; Nadyeina 2007b); 96, 100 (Nadyeina 2007b).
- Hypogymnia physodes* (L.) Nyl. — bark — 22; 36; 39; 44 (Maslova 1979; Nadyeina 2008); 59; 60; 73; 79; 98, 100 (Nadyeina 2007b).
- **Immersaria athrocarpa* (Ach.) Rambold & Pietschm. — sil sandst — 15; 51; 53; 55.
- Immersaria cupreoatra* (Nyl.) Calatayud et Rambold — sil sandst — 15; 20 (KW); 22; 24; 27; 30; 32 (KW, Oxner 1927, as *Aspicilia cupreoatra* (Nyl.) Arnold; Kondratyuk & Solonina 1990); 34; 40; 45, 48, 52, 53, 55 (Nadyeina 2008, as *Bellemerea cupreoatra* (Nyl.) Clauzade & Cl. Roux); 58, 60; 70; 74; 82; 83.
- **Intralichen christiansenii* (D. Hawksw.) D. Hawksw. & M.S. Cole — on *Candelariella aurella*, *C. vitellina* and *Protoparmeliopsis muralis* gr. — 25; 51, 52 (Nadyeina 2008).
- **Lecania cyrtella* (Ach.) Th. Fr. — bark — 73 (Nadyeina 2007a).
- **Lecania erysibe* (Ach.) Mudd — carb substrates — 36; 40.
- **Lecania koerberiana* J. Lahm. — woody stems of *Thymus* — 38; 99 (Nadyeina 2007b).
- Lecanora argopholis* (Ach.) Ach. — sil sandst — 15; 24; 27; 30 (dupl in GZU); 32 (Oxner 1925b; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998); 34; 35; 40; 44 (Maslova 1979; Nadyeina 2008); 45, 47, 48, 51, 53 (Nadyeina 2008); 60; 70; 82; 83. In all literature sources covering Ukraine, this species is referred to as *L. frustulosa* (Dicks.) Ach. According to Vänskä (1984), the only occurrences of *L. frustulosa* in Ukraine are from the Crimea, while specimens from mainland Ukraine are conspecific with *L. argopholis*. Oxner recognized two varieties of “*L. frustulosa*” in Ukraine: — var. *argopholis* (Wahlenb. ex Ach.) Körb. and var. *thioides* (Spreng.) Link (Oxner 1925a). Both of them are now treated within *L. argopholis* (Vänskä 1984).
- ***Lecanora bolcana* (Pollini) Poelt — sil sandst — 70; 82. In Ukraine, this species is also known from the Crimea (Kondratyuk *et al.* 1998).
- Lecanora carpinea* (L.) Vain. — bark — 30; 44 (Maslova 1979; Nadyeina 2008); 47, 57 (Nadyeina 2008); 59; 70; 73; 77; 78; 79; 81; 98 (Nadyeina 2007b).
- ****Lecanora chlarotera* Nyl. — bark — 34; 39; 45; 50; 53; 70; 73; 77; 79; 81; 98 (Nadyeina 2007b).
- Lecanora crenulata* Hook. — carb substrates — 15; 25; 27; 44 (Maslova 1979; Nadyeina 2008); 48, 52, 53 (Nadyeina 2008); 59; 83; 98, 99 (Nadyeina 2007).
- Lecanora dispersa* (Pers.) Sommerf. — ubiquitous on sil and carb substrates — 15 (dupl in GZU); 18 (KW); 22; 25; 30; 31; 34; 38; 40; 41; 49, 56 (Nadyeina 2008); 52; 53; 58; 59; 61 (Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998); 70; 71; 82; 83.
- **Lecanora hagenii* (Ach.) Ach. — bark — 15; 22; 24; 26; 30; 31; 34; 47, 50, 53, 56 (Nadyeina 2008); 60; 73; 79; 81; 98, 99 (Nadyeina 2007b).
- **Lecanora populicola* (DC.) Duby — bark — 70, 73 (Nadyeina 2007a).
- **Lecanora pulicaris* (Pers.) Ach. — bark — 73.
- **Lecanora rupicola* (L.) Zahlbr. — sil sandst — 15; 22; 24; 27; 47, 51, 53, 55 (dupl in GZU) (Nadyeina 2008); 58; 60; 70; 72; 82.
- **Lecanora swartzii* (Ach.) Ach. — sil substrates — 15; 83.
- **Lecanora symmicta* (Ach.) Ach. — bark — 98 (Nadyeina 2007b).
- Lecanora umbrina* (Ach.) A. Massal. — sil sandst — 27; 30; 25; 31; 35; 38; 44 (Maslova 1979; Nadyeina 2008, as *L. lithophila* (Wallr.) Oxner); 52, 53, 55 (dupl in GZU), 56 (Nadyeina 2008, as *L. lithophila*); 49; 59; 60; 70; 71; 73; 82; 83.
- **Lecidea fuscoatra* (L.) Ach. — carb sandst — 15 (dupl in GZU); 24; 34; 40; 51, 53 (Nadyeina 2008); 70; 72; 82.
- **Lecidea lichenicola* (A.L. Sm. & Ramsb.) D. Hawksw. — chalk outcrops in forest and small marl rocks on a slope — 89 (Oxner 1955; Oxner 1956; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998 — in all sources called

Thrombium cretaceum Oxner; Nadyeina 2007b); 98, 99 (Nadyeina 2007b).

This species was described in 1918 as *Discocera lichenicola* A.L. Sm. & Ramsb. It was only later that the apothecial nature of its ascoma and *Lecidea*-type asci were demonstrated and it was combined to *Lecidea*, but Hawksworth (1978) suggested its position within this genus is isolated. Another species, *Thrombium cretaceum* Walt. Watson was described in 1933 from chalk stones in beech woods in East Dean, Great Britain. The author also noted the similarity of the species with *Lecidea* (in its pale pink spores and paraphyses) (Swinscow 1964). *T. cretaceum* Walt. Watson was also subsequently synonymised with *Lecidea lichenicola* (Hawksworth 1978). In 1955, A.M. Oxner described *Thrombium cretaceum* Oxner from chalk outcrops in the area now belonging to the “Sviati Gory” National Nature Park (Donetsk Region, Ukraine). The type material of *T. cretaceum* Oxner had not been seen when the synonyms of “*Lecidea lichenicola*” were proposed, and thus a question mark hung over the synonymy of *T. cretaceum* Oxner with “*Lecidea lichenicola*” until now.

The discovery of *T. cretaceum* Oxner from “Sviati Gory” was the first record of the species in Ukraine in many decades. However, in 2005 T.O. Smerechinska recorded “*Lecidea lichenicola*” from shaded limestones of “Medobory” Nature Reserve (Ternopil Region, Ukraine) and emphasised differences between asci characteristic and spore size of samples from “Medobory”, type material from “Sviati Gory” and the diagnosis in the original protologue of *T. cretaceum* Oxner (Smerechinska 2005). We collected samples from the type locality of *T. cretaceum* Oxner (chalk slope along the Siverskyi Donets River in “Sviati Gory”). Our samples were identical to the type material of *T. cretaceum* Oxner as well as to samples of T.O. Smerechinska from “Medobory” (KW). All those samples have apothecia, which at different stages are immersed in the substrate (depending on the structure of the substrate) and have typical *Lecidea*-type apical ascus structures. Therefore, all of these samples can be considered to belong to “*Lecidea lichenicola*”.

Lecidea lithophila (Ach.) Ach. — sil sandst — 20 (Oxner 1968; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998); 70.

***Lecidea plana* (Lahm) Nyl. — sil sandst — 27 (det. W. Obermayer, dupl in GZU); 30; 34; 52; 70; 72; 82. In Ukraine, the species is known from the Carpathians (Kondratyuk *et al.* 1998). A previous record from the Ukrainian steppe zone was given with a question mark (Kondratyuk *et al.* 1998).

**Lecidella carpathica* Körb. — sil sandst — 15; 24; 27; 30; 31; 40; 45, 48 (det. W. Obermayer, dupl in GZU), 55, 51, 52, 53 (Nadyeina 2008); 59; 70; 79; 82.

Lecidella elaeochroma (Ach.) M. Choisy — bark — 44 (Maslova 1979, as *Lecidea glomerulosa* Steud.; Nadyeina 2008); 53 (Nadyeina 2008); 70; 72; 73; 84 (Shperk 1870, as *Lecidella enteroleuca* Ach. *a vulgaris* Körb.;

Kashmenskyi 1906 cited Shperk as *Lecidea glomerulosa* Steud.; Kondratyuk & Solonina 1990, as *Lecidella euphorea* (Flörke) Hertel, Nadyeina 2007b); 98 (Nadyeina 2007b).

***Lepraria eburnea* J. R. Laundon — mosses — 78 (det. H. Mayrhofer). In Ukraine, the species is also known from the Carpathians (Kukwa 2001; Kukwa & Sagin 2001; Kukwa & Sliwa 2005).

**Lepraria incana* (L.) Ach. — bark and sil schists — 34; 59; 70; 83; 100 (all samples conf. by H. Mayrhofer).

****Lepraria lobificans* Nyl. — sil sandst, sil schists, mosses — 15; 22; 24 (Nadyeina 2006a, b); 34; 38; 40; 53 (Nadyeina 2008); 58; 60; 70; 73; 77; 78; 79; 82; 83; 96, 98, 100 (Nadyeina 2007b). All samples conf. by H. Mayrhofer. In Ukraine, the species is also known from the Carpathians (Kondratyuk *et al.* 1998), the forest-steppe zone (Smerechinska 2005) and the Crimea (Khodosovtsev 2004).

***Lepraria vouauxii* (Hue) R. C. Harris — mosses on carb substrates — 30; 34; 38; 52 (all samples det. H. Mayrhofer). This species is distinguished from the similar *L. membranaceum* by its thick yellowish thallus without marginal lobes, less prominent prothallus and different chemistry (Tønberg 1992). In Ukraine, the species is also known from Zakarpattia (Coppins *et al.* 2001; Kondratyuk *et al.* 1998, 2003; Kukwa & Sliwa 2005) and Crimea (Khodosovtsev 2004).

**Leprocaulon microscopicum* (Vill.) Gams in D. Hawksw. — sil sandst — 15 (Nadyeina 2006a&b). In Ukraine, the species was previously known from the Carpathians (Kondratyuk *et al.* 1998), the Mykolaiv Region (Mikhailyk 2004) and the Crimea (Khodosovtsev 2004).

****Leptogium schraderi* (Bernh.) Nyl. — soil — 27 (Nadyeina 2006b); 99 (Nadyeina 2007b). This species has only recently been reported as new to Ukraine from the Crimea (Khodosovtsev 2004) and Kharkiv Region (Gromakova 2005) as well as from Russia (Muchnik & Urbanavichus 2001).

***Leptogium subtile* (Schrad.) Torss. — mosses on wood — 98 (Nadyeina 2007b). In Ukraine, this species is also known from the Carpathians (Oxner 1956; Kondratyuk *et al.* 1998).

**Lichenodiplis lecanorae* (Vouaux) Dyko & D. Hawksw. — on *Lecanora hagenii* — 15; 22.

***Lichenostigma cosmopolites* Hafellner & Calatayud — on *Xanthoparmelia stenophylla* — 15 (Nadyeina 2006b, c; Fedorenko *et al.* 2007); 51 (Nadyeina 2006b, c; Fedorenko *et al.* 2007; Nadyeina 2008).

**Lichenostigma elongata* Nav.-Ros. & Hafellner — on *Aspicilia reticulata* — 70 (det. O. Khodosovtsev). In Ukraine, the species was known from Zakarpattia, the Carpathians and the Mykolaiv Region (Kondratyuk *et al.* 1998, 2003; Boyko 2008).

***Lichenothelia convexa* Henssen — among *Aspicilia*, *Acarospora* and *Rhizocarpon* thalli on sil sandst — 25 (Nadyeina 2006b, c; Fedorenko *et al.* 2007); 48, 49,

- 51, 53, 55 (Nadyeina 2006b, c; Fedorenko *et al.* 2007; Nadyeina 2008); 58. In Ukraine, this species was previously known from the Carpathians (Khodosovtsev & Postoialkin 2006) and the Crimea (Khodosovtsev 2004).
- **Lobothallia radiosa* (Hoffm.) Hafellner — sil sandst — 15; 27; 30; 35; 41; 48, 52 (dupl in *GZU*) (Nadyeina 2008); 58; 70; 72; 82; 83.
- Melanelia exasperatula* (Nyl.) Essl. — bark — 36; 60; 88 (Kondratyuk & Solonina 1990; Oxner 1993; Kondratyuk *et al.* 1998, as *Parmelia exasperatula* Nyl.; Nadyeina 2007b); 98 (Nadyeina 2007b).
- Melanelia fuliginosa* (Fr. ex Duby) Essl. — bark — 22; 31; 36; 38; 44 (Maslova 1979, as *Parmelia fuliginosa* (Fr.) Nyl.; Nadyeina 2008); 56 (Nadyeina 2008); 61 (Kondratyuk & Solonina 1990; Oxner 1993; Kondratyuk *et al.* 1998, as *Melanelia glabratula* (Lamy) Essl. subsp. *fuliginosa* (Duby) J. R. Laundon and *Parmelia fuliginosa* (Fr.) Nyl.; 70; 73; 79; 98 (Nadyeina 2007b).
- ****Micarea prasina* Fr. — bark — 15; 22; 38; 39; 47, 50 (Nadyeina 2008); 59; 70; 73; 74; 77; 82.
- ***Micarea cf. subnigrata* (Nyl.) Coppins & H. Kiliass — sil sandst — 58; 70. The species is known from the Slovakian Eastern Carpathians (Kondratyuk *et al.* 2003).
- **Muellerella lichenicola* (Sommerf. : Fr.) D. Hawksw. — on *Rinodina bischoffii* — 27 (Fedorenko *et al.* 2007).
- **Muellerella pygmaea* (Körb.) D. Hawksw. — on *Acarospora* and *Bellemeria* thalli — 47, 51, 55 (Nadyeina 2006b, c; Fedorenko *et al.* 2007; Nadyeina 2008).
- **Mycobilimbia sabuletorum* (Schreb.) Hafellner — exposed roots of *Pinus* — 98 (Nadyeina 2007b).
- **Neofuscelia pokornyii* (Zahlbr.) Essl. — small sil rocks — 15; 24; 27 (dupl in *GZU*); 30; 45, 47, 48, 55 (Nadyeina 2008); 58; 60; 70; 82.
- Neofuscelia pulla* (Ach.) Essl. — sil sandst — 20, 23, 32 (Oxner 1927, as *Parmelia pulla* Ach.); 7, 13, 33 (Kondratyuk & Solonina 1990; Oxner 1993; Kondratyuk *et al.* 1998); 15; 22; 27; 30; 35; 40; 44 (Maslova 1979, as *Parmelia pulla* Ach.; Nadyeina 2008); 47, 48, 51, 55 (Nadyeina 2008); 58; 59; 60; 66, 67, 80 (Kondratyuk & Solonina 1990; Oxner 1993; Kondratyuk *et al.* 1998); 70; 74; 79; 82.
- Neofuscelia ryssolea* (Ach.) Essl. — soil — 12, 18, 23, 28, 42 (Roms & Blum 1988; Kondratyuk & Solonina 1990; Oxner 1993; Kondratyuk *et al.* 1998); 15; 16; 24; 31; 58; 74; 82.
- *Opegrapha rufescens* Pers. — 84 (Shperk 1870; Oxner 1956; Nadyeina 2007b cit. Shperk's record).
- Opegrapha varia* Pers. — bark — 70 (Nadyeina 2007a); 84 (Shperk 1870, as *O. varia* Pers. α *notha* Ach. & β *diaphora* Ach.; Kashmenskyi 1906; Nadyeina 2007b); 88 (Oxner 1956; Nadyeina 2007b).
- Parmelia sulcata* Taylor — bark — 15; 22; 31; 32 (Oxner 1927, Kondratyuk & Solonina 1990, Oxner 1993, Kondratyuk *et al.* 1998); 34; 39; 44 (Maslova 1979, Nadyeina 2008); 53 (Nadyeina 2008); 58; 59; 60; 61 (Kondratyuk & Solonina 1990; Oxner 1993; Kondratyuk *et al.* 1998); 73; 79; 98, 100 (Nadyeina 2007b).
- Parmelina tiliacea* (Hoffm.) Hale — bark — 69 (Kondratyuk & Solonina 1990; Oxner 1993; Kondratyuk *et al.* 1998); 70; 79; 84 (Shperk 1870, as *Imbricaria tiliacea* Ehrh. α *scorteae* Ach.; Kashmenskyi 1906 cited Shperk as *Parmelia tiliacea* (Hoffm.) Fr., Nadyeina 2007b); 88, 90 (Kondratyuk & Solonina 1990; Oxner 1993; Kondratyuk *et al.* 1998; Nadyeina 2007b); 98 (Nadyeina 2007b).
- *Peccania coralloides* (A. Massal.) A. Massal. — 64 (Oxner 1937; Oxner 1956; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998 cit. Oxner's record).
- **Peltigera didactyla* (With.) J.R. Laundon — clay — 60.
- **Peltigera praetextata* (Floerke ex Sommerf.) Zopf — mosses on wood — 98 (Nadyeina 2007b).
- **Peltigera rufescens* (Weiss) Humb. — mosses — 70.
- **Pertusaria albescens* (Huds.) M. Choisy & Werner — bark — 98 (Nadyeina 2007b).
- ****Phaeophyscia ciliata* (Hoffm.) Moberg — dry bark — 56 (Nadyeina 2007a, 2008).
- **Phaeophyscia nigricans* (Flörke) Moberg — bark — 25; 34; 52, 53 (Nadyeina 2008); 70.
- Phaeophyscia orbicularis* (Neck.) Moberg — bark — 15; 22; 24; 25; 30; 31; 34; 41; 44 (Maslova 1979, as *Physcia orbicularis* (Neck.) Du Rietz and *Physcia virella* (Ach.) Flagey; Nadyeina 2008); 45, 47, 48, 50, 53; 57 (Nadyeina 2008); 70; 73; 78; 79; 81; 83; 98, 100 (Nadyeina 2007b).
- **Phaeophyscia sciastra* (Ach.) Moberg — sil substrates — 52; 58; 70; 82; 83.
- **Phlyctis argena* (Spreng.) Flot. — bark — 98 (Nadyeina 2007b).
- Physcia adscendens* H. Olivier — bark — 15; 22; 24; 27; 34; 44 (Maslova 1979; Nadyeina 2008); 46, 47, 53 (dupl in *GZU*), 50, 55, 56, 57 (Nadyeina 2008); 60; 70; 73; 78; 79; 81; 98 (Nadyeina 2007b).
- **Physcia aipolia* (Ehrh. ex Humb.) Fűrnr. — bark — 26; 44 (Maslova 1979; Nadyeina 2008); 48.
- Physcia caesia* (Hoffm.) Fűrnr. — sil sandst — 15; 20 (Oxner 1927; Kondratyuk & Solonina 1990); 25; 26; 27; 30; 31; 34; 40; 44 (Maslova 1979; Nadyeina 2008); 48, 51, 52, 53, 56 (Nadyeina 2008); 58; 59; 60; 70 (dupl in *GZU*); 74; 79; 82; 83.
- Physcia stellaris* (L.) Nyl. — bark — 44 (Maslova 1979; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998; Nadyeina 2008); 53, 56 (Nadyeina 2008); 61 (Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998).
- Physcia tenella* (Scop.) DC. — bark — 15; 26; 27; 31 (dupl in *GZU*); 36; 39; 44 (Maslova 1979, as *Physcia hispida* (Hoffm.) Frege; Nadyeina 2008); 50 (Nadyeina 2008); 53; 56; 57; 73.
- *Physcia tribacia* (Ach.) Nyl. — 8, 32 (Oxner 1927; Kondratyuk & Solonina 1990 cit. Oxner's record).
- Physconia distorta* (With.) J.R. Laundon — bark — 15; 38; 44 (Maslova 1979, as *Physcia pulverulenta* (Schreb.) Hampe; Nadyeina 2008); 56 (Nadyeina 2008); 60; 70; 81; 96 (Nadyeina 2007b).

- **Physconia enteroxantha* (Nyl.) Poelt — bark — 15; 30; 38; 47, 57 (Nadyeina 2008); 53; 60; 70; 74; 78; 79; 81; 98 (Nadyeina 2007b).
- Physconia grisea* (Lam.) Poelt — bark — 14, 43, 75, 76 (KW); 15; 18; 23; 24; 44 (Maslova 1979, as *Physcia grisea* (Lam.) A. Zahlbr.; Nadyeina 2008); 56.
- Placidium squamulosum* (Ach.) Breuss — clay — 3 (Oxner 1936, as *Dermatocarpon hepaticum* (Ach.) Th. Fr.; Oxner 1956, as *Endopyrenium hepaticum* (Ach.) Körb.; Kondratyuk & Solonina 1990, as *Catapyrenium lachneum* (Ach.) R. Sant.; Kondratyuk *et al.* 1998, as *C. squamulosum* (Ach.) Breuss); 27; 38; 40; 70; 99 (Nadyeina 2007b).
- *Placocarpus schaeferi* (Fr.) Breuss — 64 (Oxner 1927, 1936, as *Dermatocarpon monstrosum* (Schaer.) Vain.; Oxner 1956 and Kondratyuk & Solonina 1990, as *Endopyrenium monstrosum* (Schaer.) Hazsl.; Kondratyuk *et al.* 1998 cit. Oxner's record).
- *Placopyrenium trachyticum* (Hazsl.) Breuss in Nimis & Poelt — 20 (Oxner 1927, 1936, as *Dermatocarpon trachyticum* (Hazsl.) Vain.; Oxner 1956, as *Endopyrenium trachyticum* (Schaer.) Hazsl.; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998 cit. Oxner's record); 44 (Maslova 1979, as *Endopyrenium trachyticum* (Schaer.) Hazsl.; Nadyeina 2008 cit. Maslova's record).
- Placynthiella uliginosa* (Schrad.) Coppins & P. James — mosses and detritus — 22; 24; 27; 30; 38; 44 (Maslova 1979, as *Biatora humosa* (Hoffm.) Leight. and *B. uliginosa* (Schrad.) Fr.; Nadyeina 2008, as *Saccomorpha uliginosa* (Schrad.) Hafellner); 48; 45, 51, 53 (Nadyeina 2008, as *S. uliginosa*); 58; 59; 60; 79; 81; 82; 83.
- Pleurosticta acetabulum* (Neck.) Elix & Lumbsch — bark — 14, 19, 75 (Kondratyuk & Solonina 1990; Oxner 1993; Kondratyuk *et al.* 1998); 15; 24; 30; 44 (Maslova 1979, as *Parmelia acetabulum* (Neck.) Duby; Nadyeina 2008); 57 (Nadyeina 2008); 60; 70; 73; 79; 85, 88, 92, 96, 98 (Nadyeina 2007b).
- Polysporina simplex* (Davies) Vězda — sil sandst — 15; 18, 33 (Oxner 1968; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998); 24; 25; 27 (dupl in *GZU*); 30; 34; 44 (Maslova 1979, as *Sarcogyne simplex* (Davies) Nyl.; Nadyeina 2008); 45, 48, 53, 55, 56, 51, 52 (dupl in *GZU*) (Nadyeina 2008); 58; 59; 60; 70; 79; 82; 83.
- *Porpidia cinereoatra* (Ach.) Hertel & Knoph — 44 (Maslova 1979, as *Lecidea cinereoatra* Ach.; Nadyeina 2008 cit. Maslova's record).
- Porpidia crustulata* (Ach.) Hertel & Knoph — sil sandst — 38; 59; 61 (Oxner 1968; Kondratyuk & Solonina 1990, as *Lecidea crustulata* (Ach.) Sprengl.; Kondratyuk *et al.* 1998); 72; 83.
- Protoblastenia rupestris* (Scop.) J. Steiner — small carb rocks — 5 (Oxner 1927, 1937, as *Biatora rupestris* (Scop.) Fr.; Kondratyuk & Solonina 1990; Oxner 1993; Kondratyuk *et al.* 1998); 38; 52 (Nadyeina 2008); 59; 70 (dupl in *GZU*); 99 (Nadyeina 2007b).
- Protoparmeliopsis muralis* (Schreb.) M. Choisy — sil sandst — 8, 9, 10, 11, 20 (Oxner 1927, as *Squamarina muralis* (Schreb.) Elenkin var. *saxicola* (Pollini) Elenkin and *S. muralis* f. *albomarginata* (Nyl.) Elenkin; Kondratyuk & Solonina 1990); 15; 22; 24; 25; 27 (dupl in *GZU*); 30; 31; 34; 38; 40; 44 (Maslova 1979, as *Placolecanora muralis* (Schreb.) Räsänen; Nadyeina 2008, as *Lecanora muralis* (Schreb.) Rabenh.); 48, 48, 51, 53, 55 (Nadyeina 2008, as *L. muralis*); 58; 59; 60; 70 (dupl in *GZU*); 74; 79; 82; 83.
- *Pseudevernia furfuracea* (L.) Zopf — on old *Pinus* trees, not abundant — 84 (Shperk 1870, as *Evernia furfuracea* L.; Nadyeina 2007b cit. Shperl's record).
- **Psora decipiens* (Hedw.) Hoffm. — carb soil — 41.
- **Psorotichia moravica* Zahlbr. — carb substr — 15; 27; 82.
- *Ramalina calicaris* (L.) Fr. — 44 (Maslova 1979; Nadyeina 2008 cit. Maslova's record).
- **Ramalina capitata* (Ach.) Nyl. — sil sandst — 15; 22; 26; 30; 35; 51, 56 (Nadyeina 2008); 58 (dupl in *GZU*); 70; 73; 82; 83.
- **Ramalina farinacea* (L.) Ach. — bark — 47 (Nadyeina 2008); 96 (Nadyeina 2007b).
- **Ramalina fastigiata* (Pers.) Ach. — bark — 15; 26; 57 (Nadyeina 2008); 70; 73; 82; 96 (Nadyeina 2007b).
- **Ramalina fraxinea* (L.) Ach. — bark — 98 (Nadyeina 2007b).
- Ramalina polymorpha* (Lilj.) Ach. — sil sandst — 8, 11 (Oxner 1925a; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998); 15; 22; 27; 30; 35; 44 (Maslova 1979, Nadyeina 2008); 46; 55 (Nadyeina 2008); 58 (dupl in *GZU*); 74; 82; 83.
- Rhizocarpon distinctum* Th. Fr. — sil sandst — 15; 22; 25; 34; 40; 49 (Nadyeina 2006a); 48, 53, 55 (Nadyeina 2008); 58; 83.
- Rhizocarpon geographicum* (L.) DC. — sil sandst — 13, 18, 20, 32, 42, 63 (Oxner 1968; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998); 15; 22; 24; 27 (dupl in *GZU*); 30; 35; 40; 44 (Maslova 1979; Nadyeina 2008); 48, 51, 55 (Nadyeina 2008); 60; 70; 72; 79; 82.
- **Rimularia gibbosa* (Ach.) Coppins, Hertel & Rambold — sil sandst — 27; 48; 52; 70.
- **Rimularia insularis* (Nyl.) Rambold & Hertel — on *Lecanora rupicola* thallus — 82.
- **Rinodina bischoffii* (Hepp) A. Massal. — carb substrates — 15; 27; 30; 36; 40 (dupl in *GZU*); 48 (Nadyeina 2008); 53; 83.
- **Rinodina calcarea* (Arnold) Arnold — limest — 36 (det. H. Mayrhofer).
- *Rinodina exigua* (Ach.) Gray — 84 (Shperk 1870, as *R. metabolica* & *exigua* Ach.; Kashmennyi 1906; Kondratyuk & Solonina 1990; Kondratyuk & Navrotska 1992, as *R. metabolica* (Ach.) Anzi; Kondratyuk *et al.* 1998; Nadyeina 2007b). In Ukraine, this species is also known from the Crimea and the Carpathians (Kondratyuk *et al.* 1998). In southern Europe, *R. exigua* grows mainly in the mountains, while in Central Europe it also occurs at low to middle altitudes. It usually occurs in association with other nitrophilous species, such as *R. pyrina*, *Lecanora hagenii*, *Caloplaca alnetorum* and *C. holocarpa*. It can be

confused with *R. oleae* or *R. pyrina*, which have similar morphology, but differ in the absence of atranorin (K-) and in possessing different ascospore types (*Dirinaria*- and *Physconia*-types, respectively, while *R. exigua* has *Physcia*-type (Ropin & Mayrhofer 1993; Giralt & Mayrhofer 1994). G.F. Shperk did not record *R. pyrina* and *R. sophodes*, which have a wider distribution than *R. exigua*, so it is possible that he misidentified *R. exigua*. G.F. Shperk accepted Körber's system of lichens (Shperk 1870), and he probably used "Systema Lichenum Germaniae" (Körber 1855). This work is mainly taxonomic-floristic in nature and has no key for species identification. Because of the mentioned traits and lack of a voucher specimen of *Rinodina exigua* from the Donetsk Upland in *KW* and *LE*, I am treating the literature record from G.F. Shperk as doubtful for now.

- #*Rinodina* cf. *guzzinii* Jatta — limest — 36 (conf. H. Mayrhofer). The morphologically similar *R. bischoffii* is distinguished mainly by its ascospores with strongly pigmented bands around the septa (*Bischoffii*-type) and the absence of oil drops in the hymenium. The morphologically similar *R. calcarea* has *Tunicata*-type ascospores (Giralt 2001). *R. guzzinii* occurs in the Mediterranean and adjacent areas (Mayrhofer 1984; Giralt 2001). In the European steppe zone, it is known from the Volgograd Region in Russia (Mayrhofer 1984). The sample from the Donetsk Upland cannot be assigned to *R. guzzinii* with complete certainty (H. Mayrhofer, pers. comm.) and requires confirmation by additional samples.
- **Rinodina milvina* (Wahlenb.) Th. Fr. — sil sandst — 58. In Ukraine, the species is known from Zakarpattia (Makarevich *et al.* 1982; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998), the Crimea (Khodosovtsev 2004) and the Pridniprovsk and Priazovska Uplands in the Ukrainian Plain (Kondratyuk 1985; Zelenko 2006). As the species is rather more typical of high mountains (e.g. Mayrhofer 1984; Giralt 2001), the records from low altitudes of the Ukrainian Plain are remarkable.
- **Rinodina pyrina* (Ach.) Arnold — bark — 15; 25; 27; 31; 36; 38; 46; 50, 53 (dupl in *GZU*), 56, 57 (Nadyeina 2008); 70; 73; 78; 82; 98, 99 (Nadyeina 2007b).
- **Rinodina sophodes* (Ach.) A. Massal. — bark — 73 (Nadyeina 2007a).
- Sarcogyne privigna* (Ach.) A. Massal. — sil sandst — 22; 24; 25; 26; 30; 31; 38; 44 (Maslova 1979; Nadyeina 2008); 48; 49; 51 (dupl in *GZU*); 53 (Nadyeina 2008); 58; 59; 82; 83.
- Sarcogyne regularis* Körb. — carb substr — 8 (Oxner 1927 as *S. pruinosa* (Sm.) Körb.; Oxner 1968; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998); 27; 31; 38 (dupl in *GZU*); 83; 93 (Oxner 1925b, 1927a, as *S. pruinosa* (Sm.) Körb.; Oxner 1968; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998; Nadyeina 2007b); 99 (Nadyeina 2007b).
- **Scoliciosporum chlorococcum* (Graewe ex Stenh.) Vězda — bark — 22; 30; 31; 36; 53, 57 (Nadyeina 2008); 60; 70; 73; 77; 78; 79; 81; 98 (Nadyeina 2007b).
- Scoliciosporum perpusillum* (J. Lahm) Körb. — 84 (Shperk 1870, as *S. perpusillum* Körb.; Nadyeina 2007b cit. Shperk's record). In Ukraine, the species is also known from the Carpathians (Kondratyuk *et al.* 1998, 2003), where it rarely occurs on bark of young branches of coniferous and deciduous trees (Oxner 1968).
- **Scoliciosporum umbrinum* (Ach.) Arnold — sil sandst — 15; 25; 34; 35; 58; 59; 70.
- ****Staurothele catalepta* (Ach.) Blomb. & Forssell — carb soft substrates — 52, 53 (Nadyeina 2008 named *S. rufa* (A. Massal.) Zschacke). In Ukraine, the species was known from the steppe zone (Oxner 1956; Kondratyuk *et al.* 1998) but it is uncertain where it was collected.
- **Staurothele hymenogonia* (Nyl.) Th. Fr. — carb small rocks — 27; 40; 58; 83.
- ****Strangospora pinicola* (A. Massal.) Körb. — wood & bark — 40; 79 (Nadyeina 2007a). In Ukraine, the species was previously known from the forest-steppe zone (Kondratyuk *et al.* 1998).
- Synalissa symphorea* (Ach.) Nyl. — 64 (Oxner 1925b; Kondratyuk & Solonina 1990 cit. Oxner's record).
- ***Thelidium zwackhii* (Hepp) A. Massal. — chalk outcrop in a forest — 98 (Nadyeina 2007b, as *Thelidium* sp.). Previous records of this species from Ukraine were from the Carpathians (Kondratyuk *et al.* 2003) and the Crimea (Khodosovtsev 2004).
- **Thelocarpon* sp. — sil-carb marl — 38.
- Toninia sedifolia* (Scop.) Timdal — carb soil — 3 (Oxner 1968; Kondratyuk & Solonina 1990; Timdal 1991; Kondratyuk *et al.* 1998); 36; 64 (Oxner 1925a, 1927, as *Thalloidima coeruleonigricans* (Lightf.) Poetsch; Oxner 1968; Kondratyuk & Solonina 1990; Timdal 1991; Kondratyuk *et al.* 1998); 71.
- **Trapelia coarctata* (Sm.) M. Choisy — sil substrates — 15; 22; 24; 25; 27; 30 (dupl in *GZU*); 34; 35; 36; 40; 51; 45, 53 (Nadyeina 2008); 58; 60; 70; 79; 82; 83.
- ****Trapeliopsis granulosa* (Hoffm.) Lumbsch — mosses on sandst — 58 (det. J. Hafellner). In Ukraine, the species is known from Zakarpattia, the Crimea and the forest zone (Kondratyuk *et al.* 1998; Khodosovtsev 2004).
- Usnea hirta* (L.) Weber ex F. H. Wigg. — bark — 36 (Nadyeina 2007a); 84 (Shperk 1870, as *U. barbata* L. emend. *u. florida* L. * *hirta* Ach.; Kondratyuk & Solonina 1990; Nadyeina 2007b cit. Shperk's record).
- Verrucaria caerulea* DC. — carb substrates — 8 (*KW*, Oxner 1935, as *V. glaucina* Ach.; Oxner 1956; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998); 31; 58.
- **Verrucaria calciseda* DC. — carb schists — 27.
- Verrucaria crethophila* Oxner — chalk — 89 (Oxner 1955; Oxner 1956; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998; Nadyeina 2007b); 97 (Nadyeina 2007b). This species was described in the Donetsk Upland and was long known from only a single locality; it has been

considered a possible endemic of the Donetsk region (Oxner 1955). However, it has recently been found also in the Srednerusskaia Upland (Muchnik 2001) and in the Kherson Region (Khodosovtsev 2006).

- ***Verrucaria furfuracea* (de Lesd.) Breuss — concrete — 38 (det. J. Vondrák). In Ukraine the species is known from the Crimea, including the steppe part (Kondratyuk *et al.* 1998, as *V. macrostoma* DC.; Khodosovtsev 2004, as *V. tectorum* auct).
- Verrucaria lecideoides* Trevis. — carb substrates — 8 (Oxner 1927; Oxner 1936, as *V. lecideoides* Trevis. f. *hypothallina* Vain.; Kondratyuk & Solonina 1990); 38. Vouchers for the literature records are absent from KW and the species was omitted from the Ukrainian lichen flora (Oxner 1956).
- **Verrucaria muralis* Ach. — ubiquitous on rocks — 25; 27; 30; 36; 38; 40; 49, 53, 56 (Nadyeina 2008); 58; 59; 70; 74; 83.
- Verrucaria nigrescens* Pers. — ubiquitous on rocks — 15; 37 (Oxner 1956; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998); 27; 30; 31; 34; 36; 38; 40; 41; 44 (Maslova 1979; Nadyeina 2008); 52, 53, 55, 56 (Nadyeina 2008); 58; 59; 70; 71; 74; 82; 83; 85 (Oxner 1956; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998; Nadyeina 2007b); 98; 99 (Nadyeina 2007b).
- ***Verrucaria cf. praetermissa* (Trevis.) Anzi — limest in spring — 78 (det. O. Redchenko). In Ukraine, the species is also known from the Carpathians (Oxner 1956, Makarevich *et al.* 1982, Kondratyuk *et al.* 2003).
- *Verrucaria squamulosocrustacea* (Savicz) Oxner — 19 (Oxner 1927, 1936; Kondratyuk & Solonina 1990); 61 (Oxner 1937, 1956; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998). Vouchers for the listed records are absent from KW.
- Xanthoparmelia camtschadalis* (Ach.) Hale — soil — 67 (Roms & Blum 1988, as *Parmelia vagans* auct.; Kondratyuk & Solonina 1990; Oxner 1993; Kondratyuk *et al.* 1998); 22; 59; 70; 82.
- **Xanthoparmelia conspersa* (Ehrh. ex Ach.) Hale — sil sandst — 1 (Kondratyuk & Solonina 1990; Oxner 1993; Kondratyuk *et al.* 1998); 22; 40; 58; 60; 74; 79; 82.
- Xanthoparmelia stenophylla* (Ach.) Ahti & D. Hawksw. — sil sandst — 15 (dupl in GZU); 22; 24; 30; 32 (Oxner 1927, as *Parmelia molliuscula* Ach.; Kondratyuk & Solonina 1990; Oxner 1993; Kondratyuk *et al.* 1998, as *Xanthoparmelia somloensis* (Gyeln.) Hale); 34; 35; 40; 44 (Maslova 1979, as *Parmelia stenophylla* (Ach.) Heng.; Nadyeina 2008, as *X. somloensis* (Gyeln.) Hale); 48, 51, 55 (Nadyeina 2008, as *X. somloensis* (Gyeln.) Hale); 58; 59; 60; 70; 72; 79; 82.
- Xanthoria parietina* (L.) Th. Fr. — bark — 15; 25; 34; 35; 44 (Maslova 1979; Kondratyuk & Solonina 1990; Oxner 1993; Kondratyuk *et al.* 1998; Nadyeina 2008); 50, 53, 56, 57 (Nadyeina 2008); 60; 70; 73; 79; 83; 84 (Shperk 1870, as *Physcia parietina* L. *α vulgaris* Schaer.; Kondratyuk & Solonina 1990; Oxner 1993; Kondratyuk

et al. 1998; Nadyeina 2007b); 98, 99, 100 (Nadyeina 2007b).

**Xanthoria polycarpa* (Hoffm.) Rieber — bark — 25; 30; 36; 50, 53 (Nadyeina 2008); 99 (Nadyeina 2007b).

****Xanthoria ucrainica* S. Kondr. — bark — 15 (conf. S. Kondratyuk, dupl in GZU) (Nadyeina 2006a, b, 2007a). In Ukraine, this species is known from the Carpathians and the forest zone (Kondratyuk *et al.* 1998) and it has several isolated localities in Europe and Asia (Kondratyuk 1997; Kondratyuk *et al.* 2004).

**Zwackhiomyces coepulonus* (Norman) Grube & R. Sant. — on *Caloplaca crenulatella* — 59; 82.

Misreported records for the Donetsk Upland

Caloplaca albolutescens (Nyl.) H. Olivier. Records (Nadyeina 2006a, b, 2008) belong to *C. soralifera* or *C. xerica*.

Caloplaca lactea (A. Massal.) Zahlbr. Records (Nadyeina 2006a, b, 2008) belong to *C. crenulatella*.

Caloplaca teicholyta (Ach.) J. Steiner. Records from Luhansk Region (Oxner 1993; Kondratyuk *et al.* 1998, KW) in question belong to *C. concreticola* (see notes under that species).

Lecanora frustulosa (Dicks.) Ach. Records (Oxner 1925b; Maslova 1979; Kondratyuk & Solonina 1990; Kondratyuk *et al.* 1998) belong to *L. argopholis* (see notes under that species).

Thrombium cretaceum Oxner. Records from Sviati Gory (Oxner 1955, 1956) belong to *Lecidea lichenicola* (see notes under that species).

Conclusions

The list of lichens and their lichenicolous fungi in the Donetsk Upland contains 233 species (221 species of lichens and 12 species of lichenicolous fungi). Five species are new to Ukraine: *Caloplaca raesaenonii*, *Cladonia magyarica*, *C. peziziformis*, *Endococcus rugulosus* and *Rinodina cf. guzzinii*. Twenty-two species are new to the plain part of Ukraine, 15 to the steppe zone and 145 to the Donetsk Upland.

New records are also provided for several species recently recorded as new to Ukraine, including *Arthonia varians*, *Caloplaca crenulatella*, *C. soralifera*, *C. transcaspica*, *C. xerica*, *Candelariella oleaginescens*, *Chromatochlamys muscorum*, *Diplotomma venustum*, *Diploschistes euganeus*, *Lepraria eburnea*, *Leptogium schraderi* and *Lichenothelia convexa*.

In addition, several species previously recorded from the Donetsk Upland are excluded as probable misidentifications. *Caloplaca teicholyta*, *Lecanora frustulosa* and *Thrombium cretaceum* belong to *C. concreticola*, *L. argopholis* and *Lecidea lichenicola*, respectively. Questionable literature records for the Donetsk Upland, such as *Diploschistes scruposus* and *Rinodina exigua*, are discussed.

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