

ZWACKHIOMYCES POLISCHUKII SP. NOV., AND OTHER NOTEWORTHY LICHENICOLOUS FUNGI FROM UKRAINE

ALEXANDER YE. KHODOSOVTSSEV¹ & VALERIY V. DARMOSTUK

Abstract. The new lichenicolous fungus *Zwackhiomyces polischukii* Darmostuk & Khodos. is described from *Bacidia fraxinea* Lönnr. and *B. rubella* (Hoffm.) A. Massal. in Ukraine. *Cercidospora caudata* Kernst., *Cladophialophora parmeliae* (Etayo & Diederich) Diederich & Untereiner, *Epicladonia simplex* D. Hawksw., *Laetisaria lichenicola* Diederich, Lawrey & Van den Broeck, *Lichenochora caloplacae* Zhurb., *L. weillii* (Werner) Hafellner & R. Sant., *Microsphaeropsis caloplacae* Etayo & Yazıcı, *Pronectria casaresii* Etayo and *P. cf. dillmaniae* Zhurb. are new for Ukraine. Seven species are new for the plains of Ukraine and four species are new for the steppe zone. *Pronectria diplococca*, *P. cf. dillmaniae*, *Lichenochora caloplacae* and *Microsphaeropsis caloplacae* were previously known only from their original descriptions.

Key words: *Cercidospora*, *Pronectria*, *Lichenochora*, *Zwackhiomyces*, distribution, new species, steppe zone

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INTRODUCTION

The lichenicolous fungi of Ukraine are still poorly known, although research on them has increased recently (e.g., Braun *et al.* 2016; Darmostuk 2016; Darmostuk & Naumovich 2016; Kapets 2016; Khodosovtsev & Darmostuk 2016; Khodosovtsev *et al.* 2016a, b). Last year we organized several excursions to forests in northern and southern Ukraine, to granitic canyons along small steppe rivers and to loess outcrops in the Dnieper-Bug estuary. Lichenicolous fungi recorded during our excursions and some older herbarium collections are presented in this paper.

MATERIALS AND METHODS

Specimens were examined using standard light microscopy techniques and LOMO microscopes (MBS–1, Micromed–2). Specimens were examined in water, 10% KOH (K), Lugol’s iodine, directly (I) or after KOH pretreatment (K/I) or with Brilliant Cresyl blue (BCr). We measured specimens in water to 0.25 μm accuracy for ascospores, asci, conidia, conidiogenous cells, conidiophores, and ascomatal and pycnidial wall

cells, and to 5 μm accuracy for ascomata, basidiomata and pycnidia. Measurements are given as (min)–mean–SD–mean+SD(–max). Photographs were taken with a Levenhuk C510 NG camera. All examined specimens are deposited in the lichenological herbarium of Kherson State University (KHER).

RESULTS AND DISCUSSION

Briancoppinsia cytospora (Vouaux) Diederich, Ertz, Lawrey & van den Boom

SPECIMENS EXAMINED (all on thalli of *Parmelia sulcata* s.l.). UKRAINE. KHERSON REGION. Oleshkivskiy district, near Burkuty village, 46°23′38.6″N, 32°48′35.7″E, alt. 13 m, on *Quercus robur*, 18 Nov. 2016, A. Khodosovtsev & V. Darmostuk (KHER 10316). SUMY REGION. Sereдино-Budskiy district, Desniansko-Starogutskiy National Nature Park, Uborok, 52°15′12.7″N, 33°35′5.2″E, alt. 130 m, on *Q. robur*, 5 Aug. 2016, A. Khodosovtsev & V. Darmostuk (KHER 10178).

NOTES. This lichenicolous fungus was recently reported from the Carpathian Mts (Kondratyuk *et al.* 2003). New for the plains of Ukraine.

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***Cercidospora caudata* Kernst. s.l.**

SPECIMENS EXAMINED. UKRAINE. AUTONOMOUS REPUBLIC OF CRIMEA. Cape Plaka, 44°35'30.7"N, 34°22'12.9"E, alt. 90 m, on thalli of *Olegblumia demissa*, on porphyrite outcrops, 13 Nov. 1999, *A. Khodosovtsev & O. Redchenko* (KHER 10323).

NOTES. Our specimen has immersed ascomata (145–)150–170(–185) μm diam., a blue-green peridial wall around the ostiole, (6-)8-spored asci, and colorless, 1-septate, heteropolar ascospores (16.5–)17.0–18.5(–20.0) \times (4.0–)4.5–6.0(–6.3) μm . These characters fit the concept of *Cercidospora caudata* s.l. (Navarro-Rosinés *et al.* 2004). The taxonomy of this group is in need of a thorough revision. *Cercidospora caudata* s.l. is known from Europe: Austria (Hafellner 1987), Germany (Brackel 2007), Italy (Kernstock 1896), Spain (Etayo & Pérez-Ortega 2016), Switzerland (Groner 2009); Asia: India (Joshi *et al.* 2016), South Korea (Joshi *et al.* 2015), Turkey (Halici *et al.* 2007); Africa: Morocco (Brackel 2014); North America: USA (Triebel *et al.* 1991); South America: Guatemala (Etayo & van den Boom 2006). Originally *Cercidospora caudata* was described on *Xanthocarpia lactea* (A. Massal.) A. Massal. but our specimen was collected on *Olegblumia demissa* (Flot.) S. Y. Kondr., L. Lökös, J. Kim, A. S. Kondr., S. O. Oh & J. S. Hur.

***Cercidospora xanthoriae* (Wedd.) R. Sant. s.l.**

SPECIMENS EXAMINED. UKRAINE. MYKOLAYIV REGION. Voznesenskiy district, near Trykraty village, Buzky Gard National Nature Park, Arbuzinskiy Canyon, 47°42'24.9"N, 31°25'56.9"E, alt. 42 m, on apothecia of *Rufoplaca subpallida*, on granite outcrops, 20 Oct. 2016, *A. Khodosovtsev & V. Darmostuk* (KHER 10320).

NOTES. In contrast to *Cercidospora caudata* s.l., this species has more or less unequal ascospore cells. Although previously known from Ukraine from the Crimean peninsula (Kondratyuk *et al.* 1999; Darmostuk 2016), it is new for the plains of Ukraine.

***Cladophialophora parmeliae* (Etayo & Diederich) Diederich & Untereiner**

SPECIMEN EXAMINED. UKRAINE. MYKOLAYIV REGION. Voznesenskiy district, near Trykraty village,

Buzky Gard National Nature Park, Arbuzinskiy Canyon, 47°42'24.9"N, 31°25'56.9"E, alt. 42 m, on thalli of *Xanthoparmelia conspersa* which was also infected by *Lichenocodium erodens*, on granite outcrops, 20 Oct. 2016, *A. Khodosovtsev & V. Darmostuk* (KHER 10312).

NOTES. The species is characterized by sporodochia-like conidiomata and slightly to distinctly verrucose, ellipsoid 1-septate brownish conidia (Diederich *et al.* 2013). It is known from Europe: Austria, the Azores, France, United Kingdom (Etayo & Diederich 1996; Diederich *et al.* 2013); Asia (Zhurbenko *et al.* 2015). New for Ukraine.

***Clypeococcum cetrariae* Hafellner**

SPECIMENS EXAMINED. UKRAINE. MYKOLAYIV REGION. Ochakovskiy district, near Pokrovka village, Kinburnska Kosa Regional Landscape Park, 46°28'48.4"N, 31°39'55.9"E, alt. 2 m, on thalli of *Cetraria aculeata* above sand dunes, 18 July 2016, *V. Darmostuk* (KHER 10134). SUMY REGION. Seredyno-Budskiy district, Desniansko Starogutsky National Nature Park, near Ulytsa village, 52°18'39.6"N, 33°36'57.4"E, alt. 132 m, on thalli of *Cetraria islandica*, 5 Aug. 2016, *A. Khodosovtsev & V. Darmostuk* (KHER 10182, 10184, 10187).

NOTES. In Ukraine the species was collected in the Carpathian Mts (Pirogov 2015). New for the plains of Ukraine.

***Clypeococcum hypocenomycis* D. Hawksw.**

SPECIMEN EXAMINED. UKRAINE. KHERSON REGION. Oleshkivskiy district, near Radensk village, 46°33'57.1"N, 32°52'40.2"E, alt., 32 m, on thalli of *Hypocenomyce scalaris*, on *Pinus nigra*, 20 Nov. 2016, *V. Darmostuk* (KHER 10317).

NOTES. Although this species was recently found in the Lviv region (Pirogov 2010), it is new for the steppe zone of Ukraine.

***Epicleadonia simplex* D. Hawksw.**

SPECIMEN EXAMINED. UKRAINE. KHERSON REGION. Oleshkivskiy district, Sagi Landscape Reserve, 46°37'04.03"N, 32°50'03.13"E, alt. 15 m, on *Cladonia rangiformis*, on sand dunes, 4 Oct. 2016, *G. Naumovich* (KHER 10156).

NOTES. This is a widespread lichenicolous fungus known from Europe: Denmark (Alstrup 1994), Finland (Hawksworth 1981), Iceland

(Heidmarsson *et al.* 2009), Lithuania (Motiejūnaitė 2011), Poland (Kukwa *et al.* 2013), Sweden (Ihlen & Wedin 2006); Asia: Russia (Zhurbenko 2004), South Korea (Joshi *et al.* 2015); North America: Canada (Alstrup & Cole 1998), USA (Esslinger & Egan 1995). New for Ukraine.

Heterocephalacria bachmannii (Diederich & M. S. Christ.) Millanes & Wedin

SPECIMEN EXAMINED. UKRAINE. KHERSON REGION. Oleshkivskiy district, near Radensk village, 46°33'57.1"N, 32°52'40.2"E, alt., 32 m, on *Cladonia rangiformis*, on sand dunes, 20 Nov. 2016, *V. Darmostuk* (KHER 10324).

NOTES. This lichenicolous fungus was recently reported from the Crimean peninsula (Khodosovtsev 2013). New for the plains of Ukraine.

Illosporiopsis christiansenii (B. L. Brady & D. Hawksw.) D. Hawksw.

SPECIMENS EXAMINED (all on thalli of *Physcia adscendens*). UKRAINE. KHERSON REGION. Velykooleksandrivkiy district, Mala Oleksandrivka village, Rusova balka, 47°16'15.93"N, 33°14'05.43"E, alt. 37 m, on *Quercus robur*, 9 Jan. 2016, *V. Darmostuk* (KHER 9652); Oleshkivskiy district, near Burkutiy village, 46°23'38.6"N, 32°48'35.7"E, alt. 13 m, on *Q. robur*, 21 Nov. 2015, *A. Khodosovtsev & V. Darmostuk* (KHER 9550, 9574). MYKOLAYIV REGION. Voznesenskiy district, near Trykraty village, Buzky Gard National Nature Park, Labirynt, 47°42'24.9"N, 31°25'56.9"E, alt. 42 m, on *Fraxinus excelsior*, 21 Oct. 2016, *A. Khodosovtsev & V. Darmostuk* (KHER 10319). SUMY REGION. Seredyno-Budskiy district, Desniansko-Starogutskiy National Nature Park, near Ochkino village, 52°15'44.1"N, 33°23'21.4"E, alt. 131 m, on *Salix* sp., 1 Aug. 2016, *A. Khodosovtsev & V. Darmostuk* (KHER 10325).

NOTES. Previously known only from the Carpathian Mts (Hawksworth 1992). New for the plains of Ukraine.

Laetisaria lichenicola Diederich, Lawrey & Van den Broeck

SPECIMENS EXAMINED (all on *Physcia adscendens*). UKRAINE. KHERSON REGION. Belozerskiy district, Sofievka village, Sofiyevska Balka Botanical Reserve, 46°36'03.93"N, 32°15'41.13"E, alt. 13 m, on *Robinia*

pseudoacacia, 14 Dec. 2016, *A. Khodosovtsev & V. Darmostuk* (KHER 10318); Velykooleksandrivkiy district, Mala Oleksandrivka village, right bank of river Ingulets, 47°17'38.47"N, 33°16'24.21"E, alt. 21 m, on *Populus nigra*, 27 Nov. 2016, *V. Darmostuk* (KHER 10313).

NOTES. *Laetisaria lichenicola* grows on *Physcia* together with *Erythricium aurantiacum* (Lasch) D. Hawksw. & A. Henrici, but the former differs in the rose color of infected thalli. This is the second member of the genus *Laetisaria* in Ukraine, the other being *L. fuciformis* (Akulov *et al.* 2010). It is known from Belgium, Germany and Luxembourg (Diederich *et al.* 2011). New for Eastern Europe.

Lichenochora caloplacae Zhurb.

SPECIMENS EXAMINED. UKRAINE. KHERSON REGION. Belozerskiy district, Sofievka Balka Botanical Reserve, 46°36'03.93"N, 32°15'41.13"E, alt. 13 m, on thalli of *Athallia skii*, on plant debris, 14 Feb. 2009, *A. Khodosovtsev & L. Gavrylenko* (KHER 7574); near Alexandrovka village, 46°36'23.7"N, 32°15'54.3"E, alt. 17 m, on thalli of *A. skii*, on plant debris, 14 Dec. 2016, *A. Khodosovtsev & V. Darmostuk* (KHER 10326).

NOTES. The specimens of *Lichenochora caloplacae* from Ukraine are mostly consistent with the protologue (Zhurbenko & Brackel 2013), but differ slightly in having shorter ascospores 18–23 × 3.0–4.5 μm (14–27 × 3.5–6.0 in original description) and in the host. This recently described species was known from polar desert biomes of Svalbard and Central Siberia (Zhurbenko & Brackel 2013), growing on thalli of terricolous caloplacoid species. *Athallia skii* (Khodos., Vondrák & Šoun) Arup, Frödén & Søchting is a new host species and it is the first record of any lichenicolous fungus on this lichen. New for Ukraine.

Lichenochora weilii (Werner) Hafellner & R. Sant.

SPECIMEN EXAMINED. UKRAINE. KHERSON REGION. Oleshkivskiy district, near Burkutiy village, 46°23'38.6"N, 32°48'35.7"E, alt. 13 m, on thalli of *Physconia grisea*, on *Quercus robur*, 18 Nov. 2016, *A. Khodosovtsev & V. Darmostuk* (KHER 10311).

NOTES. The species is known from Europe: Belgium (van den Boom & Brand 2008), France

(Diederich *et al.* 2012), Germany (Kocourková & von Brackel 2005), Italy (van den Boom & Brand 2008), Latvia (Motiejūnaitė *et al.* 2016), Svalbard (Zhurbenko & Brackel 2013), Spain (Werner 1937), Sweden (Hafellner 1989), the Netherlands (van den Boom & Brand 2008); Asia: Russia (Zhurbenko & Santesson 1996); North America: Canada (Hafellner 1989); Macaronesian islands (Hafellner 2002). New for Ukraine.

Lichenostigma maureri Hafellner

SPECIMENS EXAMINED. UKRAINE. KHERSON REGION. Oleshkiivskiy district, near Burkuty village, 46°23'38.6"N, 32°48'35.7"E, alt. 13 m, on thalli of *Pseudoevernia furfuracea*, on *Quercus robur*, 21 Nov. 2015, *A. Khodosovtsev & V. Darmostuk* (KHER 9548); SUMY REGION. Seredyno-Budskiy district, Desniansko-Starogutsky National Nature Park, near Stara Guta village, 52°18'39.6"N, 33°36'57.4"E, alt. 132 m, on thalli of *P. furfuracea*, on *Q. robur*, 5 Aug. 2016, *A. Khodosovtsev & V. Darmostuk* (KHER 10254).

NOTES. In Ukraine this species was found on the Crimean peninsula and in the Carpathian Mts (Hawksworth 1992; Khodosovtsev *et al.* 2013, 2016c). New for the plains of Ukraine.

Microsphaeropsis caloplacae Etayo & Yazıcı

SPECIMEN EXAMINED. UKRAINE. KHERSON REGION. Bilozerskiy district, near Alexandrovka village, 46°36'23.7"N, 32°15'54.3"E, alt. 17 m, on thalli of *Calogaya lobulata*, on plant debris, 14 Dec. 2016, *A. Khodosovtsev & V. Darmostuk* (KHER 10326).

NOTES. This recently described species has small pycnidia 30–50 µm diam. and hyaline to brown aseptate conidia 7.2–8.3 × 4–6 µm. Our specimen has few pycnidia and differs by having slightly smaller conidia, 6.5–7.5 × 3–5 µm. It was known only from the type locality in Turkey on *Calogaya persica* (J. Steiner) Arup, Frödén & Söchting (Etayo & Yazıcı 2009). *Calogaya lobulata* (Flörke) Arup, Frödén & Söchting is a new host species. New for Ukraine.

Nectriopsis rubefaciens (Ellis & Everh.)

M. S. Cole & D. Hawksw.

SPECIMEN EXAMINED. UKRAINE. KHERSON REGION. Oleshkiivskiy district, near Burkuty village,

46°23'38.6"N, 32°48'35.7"E, alt. 13 m, on thalli of *Parmelia sulcata* above wood, 8 July 2015, *A. Khodosovtsev* (KHER 9269).

NOTES. Although previously known from the Lviv region (Pirogov 2011), it is new for the steppe zone of Ukraine.

Pronectria casaresii Etayo

SPECIMEN EXAMINED. UKRAINE. KHERSON REGION. Oleshkiivskiy district, near Burkuty village, 46°23'38.6"N, 32°48'35.7"E, alt. 13 m, on thalli of *Evernia prunastri*, on *Prunus spinosa*, 18 Nov. 2016, *A. Khodosovtsev & V. Darmostuk* (KHER 10314).

NOTES. This lichenicolous fungus was known from Spain (Etayo 1998; van den Boom & Etayo 2014). New for Eastern Europe.

Pronectria cf. *dillmaniae* Zhurb.

SPECIMEN EXAMINED. UKRAINE. KHERSON REGION. Belozerskiy district, near Vysunci village, 46°43'23.8"N, 32°35'26.0"E, alt. 15 m, on thalli of *Placidium squamulosum* above soil, 8 May 2016, *I. Moysiyyenko* (KHER 10315).

NOTES. The specimen is poorly developed, with three perithecia only, but we identified it as *Pronectria* cf. *dillmaniae*: ascospores 8.5–10.5 × 5.2–6.3 µm (vs 6–12 × 4–7 µm in original description) and perithecia ca 120 µm diam. (vs. 100–200 µm). Our material was found on *Placidium squamulosum* (Ach.) Breuss, whereas the original host in the type locality in the USA is *Catapyrenium cinereum* (Pers.) Körb. (Zhurbenko *et al.* 2005). *Pronectria dillmaniae* is not known otherwise from Europe.

Pronectria diplococca Kocourk., Khodos., Naumovich, Vondrák & Motiej.

SPECIMEN EXAMINED. UKRAINE. POLTAVA REGION. Semenivsky district, near Obolon village, saline soil, on *Enchylium tenax*, 49°33'2"N, 32°51'35.8"E, 3 May 2016, *A. Khodosovtsev & V. Darmostuk* (KHER 9866).

NOTES. A recently described species (Khodosovtsev *et al.* 2012) based on material from Ukraine, Lithuania and the Czech Republic. Here we provide a further locality in the forest-steppe zone of Ukraine.

Stigmidium squamariae (B. de Lesd.) Cl. Roux & Triebel

SPECIMEN EXAMINED. UKRAINE. MYKOLAYIV REGION. Voznesenskiy district, near Trykraty village, Buzky Gard National Nature Park, Arbuzinskiy Canyon, 47°42'24.9"N, 31°25'56.9"E, alt. 42 m, on apothecia of *Protoparmeliopsis muralis*, on granite outcrops, 20 Oct. 2016, A. Khodosovtsev & V. Darmostuk (KHER 10321).

NOTES. In Ukraine it was known from the Lviv region (Pirogov 2012a). New for the steppe zone of Ukraine.

Tremella phaeophysciae Diederich & M. S. Christ.

SPECIMEN EXAMINED. UKRAINE. MYKOLAYIV REGION. Voznesenskiy district, near Trykraty village, Buzky Gard National Nature Park, Labirynt, 47°42'24.9"N, 31°25'56.9"E, alt. 42 m, on thalli of *Physconia grisea*, on *Fraxinus excelsior*, 21 Oct. 2016, A. Khodosovtsev & V. Darmostuk (KHER 10310).

NOTES. In Ukraine it was known from the Carpathian Mts (Kondratyuk 2012). New for the plains of Ukraine.

Xenonectriella leptaleae (J. Steiner) Rossman & Lowen

SPECIMENS EXAMINED (all on apothecia of *Physcia stellaris*). UKRAINE. MYKOLAYIV REGION. Voznesenskiy district, near Trykraty village, Buzky Gard National Nature Park, Labirynt, 47°42'24.9"N, 31°25'56.9"E, alt. 42 m, on *Fraxinus excelsior*, 21 Oct. 2016, A. Khodosovtsev & V. Darmostuk (KHER 10322). SUMY REGION. Seredyno-Budskiy district, Desniansko-Starogutsky National Nature Park, near Ochkino village, 52°15'44.1"N, 33°23'21.4"E, alt. 131 m, on *Salix* sp., 1 Aug. 2016, A. Khodosovtsev & V. Darmostuk (KHER 10280).

NOTES. In Ukraine it was known from the Lviv region (Pirogov 2012b). New for the steppe zone of Ukraine.

Zwackhiomyces polischukii Darmostuk & Khodos., *sp. nov.* Fig. 1

MYCOBANK MB 820101

DIAGNOSIS. Morphologically similar to the lichenicolous *Zwackhiomyces socialis*, but differs

by its ascospores (17.0–)18.0–21.6(–23.0) × (5.0–)6.0–7.6(–8.3) μm, ascomata (160–)170–190(–230) μm diam., ascomatal wall ca 15–35 μm wide, and *Bacidia* hosts.

TYPE: UKRAINE. AUTONOMOUS REPUBLIC OF CRIMEA. Livadia, 44°27'50.9"N, 34°08'26.6"E, alt. 102 m, on *Bacidia fraxinea*, on *Carpinus betulis*, 6 May 2006, A. Khodosovtsev & Yu. Khodosovtseva (HOLOTYPE – KHER 7208, ISOTYPE – KHER 7401).

PARATYPES (both on thalli of *Bacidia rubella*). UKRAINE. AUTONOMOUS REPUBLIC OF CRIMEA. Mount Castel, western slope, 44°43'360.6"N, 34°19'42.8"E, alt. 110 m, on *Carpinus betulis*, 15 November 2001, A. Khodosovtsev, S. Zelenko & O. Bogdan (KHER 2106); Bakhchysarayskiy district, near Manhup-Kale, on *Quercus* sp., 8 March 1991, A. Khodosovtsev (KHER 10360). KHMELNYTSKIY REGION. Kamenetz-Podilskiy district, Podilski Yovtry National Nature Park, 48°40'35.2"N, 26°34'28.6"E, alt. 193 m, on *Acer* sp., 25 June 2003, O. Bogdan (KHER 7442).

DESCRIPTION. Vegetative hyphae not observed. Ascomata perithecioid, immersed in initial states, semi-immersed at maturity, scattered or in groups of 3–5 pseudothecia, black, subglobose, (160–)170–190(–230) μm diam. (n = 20); ascomatal wall pseudoparenchymatous, dark brown in outer part, brown in middle, and hyaline in inner part; (15–)25–30(–35) μm wide (n = 20), with 5–8 layers of cells; cells rounded in outer parts and ± radially compressed in inner part, (4.3–)7.3 ± 0.5(–8.8) (n = 25) μm wide; granular brown pigments extracellular, turning black or olive-black in K. Hymenial gel I–, K/I–. Paraphysoids abundant, branched and anastomosing, 1.5–2.5 μm thick. Asci clavate, uniseriate to biseriate, (4–)8-spored, (60–)65–70(–75) × (12–)13.5–15.0(–16) μm (n = 15), endoascus I–, BCr–. Ascospores ellipsoid, 1-septate, hyaline, verrucose, markedly constricted at septum, slightly heteropolar, (17.0–)18.0–21.6(–23.0) × (5.0–)6.0–7.6(–8.3) μm, upper cell ± rounded, lower cell narrower than upper and slightly attenuated, sometimes upper cells with oil droplets; ascospore length/breadth ratio: (1.7–)2.0–2.7(–3.1) (n = 30), halo indistinct, 0.5 μm thick in water. Conidiomata not observed.

HOST, ECOLOGY AND DISTRIBUTION. The species grows on the thallus of *Bacidia fraxinea* Lönnr.

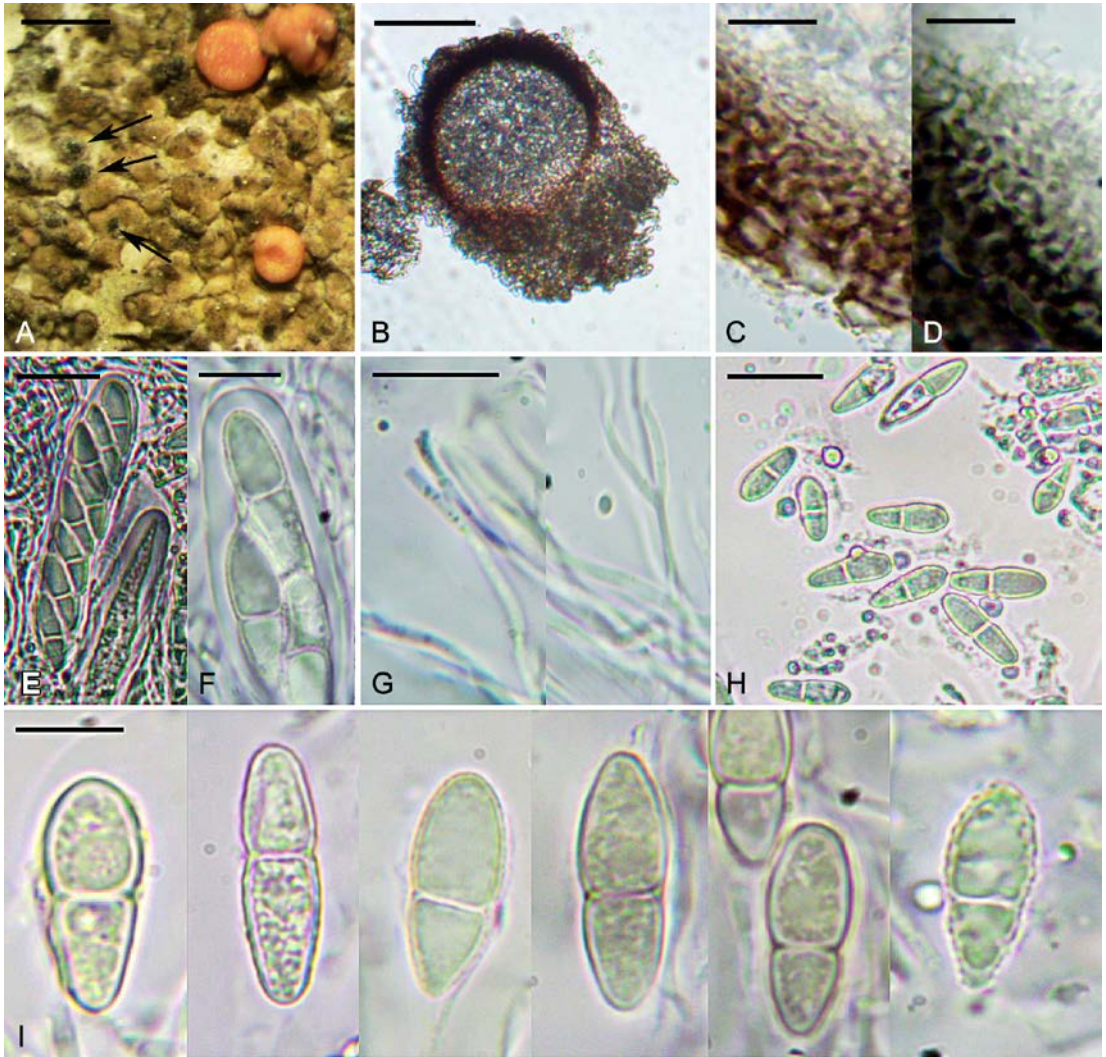


Fig. 1. Morphology of *Zwackhiomyces polischukii* (all from holotype): A – ascomata (arrows) on thallus of *Bacidia fraxinea*; B – section through ascoma; C – ascomatal wall (in water); D – ascomatal wall (in KOH); E – asci (in water); F – ascus (in KOH); G – paraphysoids (in KOH); H – ascospores (in water); I – ascospores (in water). Scale bars: A = 500 μm ; B = 100 μm ; C, D, F, I = 10 μm ; E, G, H = 20 μm .

and *B. rubella* (Hoffm.) A. Massal. on *Acer* and *Carpinus* bark. Probably parasymbiotic or weakly parasitic, causing slight deformation of the upper thallus cortex. In one specimen (KHER 2106), apothecia of *Bacidia rubella* were also infected by *Muellerella hospitans* Stizenb. The new species is known from four localities in Ukraine.

ETYMOLOGY. The epithet “polischukii” honors the eminent Ukrainian virologist Professor Valeriy

Polischuk, who actively takes part in our lichenological excursions and discussions.

NOTES. Morphologically, *Zwackhiomyces polischukii* is similar to *Z. socialis* (Körb.) Cl. Roux (= *Z. immersae* Arn.) Grube & Triebel) described from *Clauzadea monticola* (Ach. ex Schaer.) Hafellner & Bellem. (original host) and *C. metzleri* (Körb.) Clauzade & Roux (Grube & Hafellner 1990; Roux 2009). Records of *Z. socialis* from

terricolous *Bacidia baggiettoana* (A. Massal. & De Not.) Jatta (Vouaux 1913) need confirmation. *Zwackhiomyces socialis* differs from the new species by its smaller ascomata (120–150 µm diam. vs. 160–230 in *Z. polischukii*), smaller ascospores (15.7–18.0 × 5.0–5.8 µm vs. 18.0–21.6 × 6.0–7.6 µm in *Z. polischukii*) and thinner perithecial wall (up to 20 µm vs. up to 35 µm in *Z. polischukii*). *Zwackhiomyces berengerianus* (Arnold) Grube & Triebel has pale brown overmature ascospores (hyaline in *Z. polischukii*), longer asci (70–95 vs. 60–75 in *Z. polischukii*), slightly larger ascospores (17–27 × 5–10 µm vs. 17–23 × 5.0–8.3 µm in *Z. polischukii*), and having *Mycobilimbia berengeriana* (A. Massal.) Hafellner & V. Wirth as the host (Grube & Hafellner 1990). Few *Zwackhiomyces* species have ascospores similar in size to those of *Z. polischukii*. *Zwackhiomyces dispersus* (J. Lahm ex Körb.) Triebel & Grube differs from *Z. polischukii* by having smaller pyriform ascomata (100–170 µm diam. vs. 160–230 µm diam. in *Z. polischukii*), and occurs on *Protoblastenia rupestris*. The recently described *Zwackhiomyces solenopsorae* van den Boom differs in having smaller ascomata (70–150 µm diam. vs. 160–230 µm diam. in *Z. polischukii*), wider asci (17–20 µm wide vs. 12–16 µm wide in *Z. polischukii*), and occurs on the thallus of *Solenospora holophaea* (Mont.) G. Samp. (van den Boom 2010). *Zwackhiomyces turcicus* Kocakaya, Halıcı & A. Aksoy has distinctly larger ascomata (200–450 µm diam. vs. 160–230 µm diam. in *Z. polischukii*), a wider perithecial wall (30–60 µm wide vs. 15–35 µm wide), mostly 6-spored asci (8-spored in *Z. polischukii*), and *Physcia* as host (Kocakaya *et al.* 2011).

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