

CONTRIBUTIONS TO THE KNOWLEDGE OF THE NECTRIOID BRYOPHILOUS AND LICHENICOLOUS FUNGI (ASCOMYCOTA, HYPOCREALES) OF HUNGARY

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Németh, Cs. (2024): Contributions to the knowledge of the nectrioid bryophilous and lichenicolous fungi (Ascomycota, Hypocreales) of Hungary. – *Studia bot. hung.* 55(1): 141–153.

Abstract: The present study reports the discovery of three bryophilous and six lichenicolous species of nectrioid Sordariomycetes in Hungary. The bryophilous species *Bryocentria brongniartii* was found to be growing on *Frullania dilatata*, *B. metzgeriae* on *Radula complanata* and *Metzgeria furcata*, while *Nectria muscivora* on *Barbula unguiculata* and *Didymodon cordatus*. The lichenicolous species *Paranectria oropensis* was collected on *Candelaria concolor*, *Physcia adscendens*, *Physconia enteroxantha* and *Melanelixia glabratula*, *Pronectria oligospora* on *Punctelia subrudecta*, *Pronectria pertusariicola* on *Pertusaria albescens*, while *Nectriopsis rubefaciens* on *Parmelia sulcata* and *Hypogymnia physodes*. *Xenonectriella septemseptata* was found on *Melanelixia glabratula*, while *X. subimperspicua* was observed on *Melanelixia glabratula* and *Hypogymnia physodes*. This is the first report to document *Hypogymnia physodes* as a host for *Xenonectriella subimperspicua*.

Key words: biotrophic parasite, bryophilous fungi, lichenicolous fungi, necrotrophic parasite, Sordariomycetes

INTRODUCTION

Nectrioid fungi are a group of fungi that includes the genus *Nectria* (Fr.) Fr. and its related genera. They are primarily found in the families Bionectriaceae and Nectriaceae, which are part of the order Hypocreales. These fungi are characterised by small, brightly coloured, and soft-textured perithecia. They can be saprobes or parasites, with the latter divided into two categories: biotrophic and necrotrophic. They can grow on soil, dung, fungi, animals, and plants. Some genera within this group have adapted to parasitise bryophytes (bryophilous) or lichens (lichenicolous). Regarding nectrioid lichenicolous fungi, the Hungarian fauna is represented by a single species, namely *Pronectria robergei* (Mont. et Desm.) Lowen (VARGA *et al.* 2021, 2023). However, to date, no species belonging to the bryophilous group have been reported from Hungary.

MATERIAL AND METHODS

The microscopic observations were carried out on fresh material immersing the specimens in tap water, but spores of *Bryocentria* species were studied after staining with lactophenol cotton blue, as well. Spore size and other microscopic quantitative characters were measured by means of AxioVision 4.8.2. All the specimens listed below were collected by the author. Voucher specimens have been deposited in the private collection of the author (CSN) and in the Botanical Department of the Hungarian Natural History Museum, Budapest, Hungary (BP).

RESULTS AND DISCUSSION

Bryophilous species

Bryocentria brongniartii (P. Crouan et H. Crouan) Döbbele
(Fig. 1A–B)

Bryocentria brongniartii is a leaf-perforating (perithecia develop on the ventral side of the leaves and perforate them) biotrophic parasite on the leafy liverworts *Frullania dilatata* (L.) Dumort. (in Europe), as well as *F. brittoniae* A. Evans and *F. eboracensis* Gottsche (in the USA).

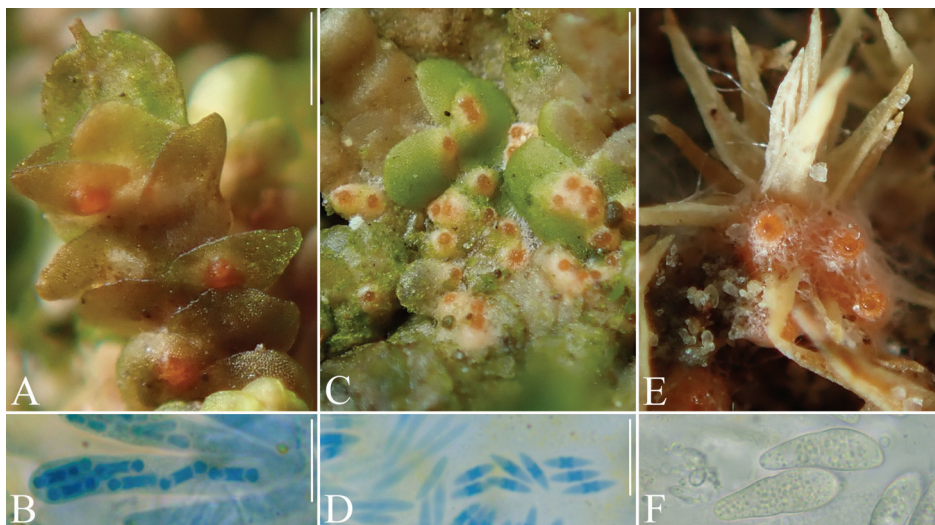


Fig. 1. Bryophilous species. – A, B = *Bryocentria brongniartii*. A = Ascomata forming orange spots on *Frullania dilatata*. B = Asci with ascospores. C, D = *Bryocentria metzgeriae*. C = Ascomata perforating the leaves of *Radula complanata*. D = Asci with ascospores. – E, F = *Nectria muscivora*. E = Ascomata growing on *Didymodon cordatus*. F = Free ascospores. Scale bars: A, C, E = 500 µm; B, D = 10 µm; F = 20 µm (A, B = CSN 11985; C, D = CSN 11288; E, F = CSN 10439; B, D = stained with lactophenol cotton blue) (Photos by C. Németh).

The perithecia are orange in colour. The ascospores are $6.5\text{--}7.5 \times 2\text{--}2.5 \mu\text{m}$ in size and dumbbell-shaped. They are colourless, two-celled, and possess a central cyanophilous transverse band (DÖBBELER 2004).

Bryocentria brongniartii has been reported from a number of countries, including Austria, Belarus, England, Finland, France, Germany, Greece, Ireland, Italy, Portugal, Spain, Sweden, and Switzerland (DÖBBELER and HERTEL 2013, FRIEBES *et al.* 2024), and the USA (DÖBBELER and DAVISON 2017, DÖBBELER *et al.* 2023).

Specimens examined: Hungary, Vendvidék, Szakonyfalu, Valley of Szakonyfalvi-patak, $46^\circ 55' 03.8''$ N, $16^\circ 12' 59.4''$ E, ca 285 m, 26.12.2023, on bark of *Fagus sylvatica* L. on *Frullania dilatata*, CSN 11985, [BP 112991]; *ibid.*, $46^\circ 54' 44.6''$ N, $16^\circ 13' 06.8''$ E, ca 310 m, CSN 11991, [BP 112992].

***Bryocentria metzgeriae* (Ade et Höhn.) Döbbeler**
(Fig. 1C–D)

Bryocentria metzgeriae is a necrotrophic parasite species developing its perithecia on the ventral leaf sides of the host liverworts. After perforating the leaves, the ostioles become well visible on the dorsal surface. *Bryocentria metzgeriae* has a wide host range of corticolous liverworts (*Frullania dilatata*, *Lejeunea cavifolia* (Ehrh.) Lindb., *Metzgeria furcata* (L.) Corda, and *Porella platyphylla* (L.) Pfeiff.), but it is most frequently reported on *Radula complanata* (L.) Dumort. (DÖBBELER 2010).

The perithecia are orange in colour. The ascospores, which are $5.5\text{--}7.5 \times 1.5\text{--}2 \mu\text{m}$ in size and two-celled, are colourless and fusiform, with a central cyanophilous transverse band (DÖBBELER 2004).

Bryocentria metzgeriae is a widespread species, occurring with great frequency in Europe (DÖBBELER 2004, 2010, FRIEBES *et al.* 2024) and also in North America (DÖBBELER *et al.* 2023).

Specimens examined: Hungary, Vendvidék, Szakonyfalu, Valley of Szakonyfalvi-patak, $46^\circ 55' 08.5''$ N, $16^\circ 13' 06.3''$ E, ca 260 m, 26.12.2023, on bark of *Fagus sylvatica* on *Radula complanata*, CSN 11984, [BP 112993]; *ibid.*, $46^\circ 54' 44.6''$ N, $16^\circ 13' 6.8''$ E, ca 310 m, on bark of *Fagus sylvatica* on *Radula complanata* and *Metzgeria furcata*, CSN 11992. Apátistvánfalva, Valley of Zsida-patak, $46^\circ 54' 50.1''$ N, $16^\circ 15' 37.8''$ E, ca 290 m, 26.12.2022, on bark of *Fagus sylvatica* on *Radula complanata*, CSN 11288.

***Nectria muscivora* (Berk. et Broome) Berk.**
(Fig. 1E–F)

Nectria muscivora is a necrotrophic bryoparasite that kills its host. It has been reported from a few European countries, including Germany, England, and

France, on various moss species, primarily of the family Pottiaceae, but also of the Bryaceae and Grimmiaceae. The perithecia are orange-coloured and white-woolly due to adjacent hyphae, particularly in the lower part. The ascospores are 20–30 μm in length and 6–8 μm in width, two-celled, colourless, and ellipsoidal with rounded ends (DÖBBELER 1978).

Specimens examined: Hungary, Vértes Mts, Csákberény, Orondi-szőlők, 47° 20' 45.0" N, 18° 19' 02.8" E, ca 240 m, 06.02.2021, on loess soil on *Barbula unguiculata* Hedw. and *Didymodon cordatus* Jur., CSN 10439, [BP 112994]; ibid., 10.12.2022, on loess wall on *Barbula unguiculata*, CSN 11259. – Hungary, Northern Mezőföld, Lovasberény, Kazal-hegy, 47° 17' 53.1" N, 18° 33' 48.2" E, ca 160 m, 07.01.2023, on loess soil on *Barbula unguiculata*, CSN 11365. – Hungary, Gerecse Mts, Neszmély, Pap-hegy, 47° 43' 51.8" N, 18° 22' 08.7" E, ca 190 m, 17.02.2024, on loess wall on *Didymodon cordatus*, CSN 12079.

Lichenicolous species

Nectriopsis rubefaciens (Ellis et Everh.) M. S. Cole et D. Hawksw.
(syn.: *Trichonectria rubefaciens* Ellis et Everh.) Diederich et Schroers)
(Fig. 2A–B)

Nectriopsis rubefaciens is a common species in Europe (ETAYO and LÓPEZ DE SILANES 2024) and the USA (LOWEN 1995). The species is found on members of the family Parmeliaceae (*Evernia*, *Flavoparmelia*, *Parmelia*, *Parmotrema*, *Platismatia*, *Pleurosticta*, and *Punctelia*, BRACKEL 2014), with the majority of occurrences on *Parmelia sulcata* Taylor. The recently described *Nectriopsis rubefaciens* (Ellis et Everh.) Diederich et Schroers subsp. *cryptoramalinae* Etayo et López de Silanes was observed on *Ramalina farinacea* (L.) Ach. (ETAYO and LÓPEZ DE SILANES 2024, ZIMMERMANN and FEUSI 2021).

The perithecia are superficial, subglobose, and reddish orange in colour. The ascospores are 1-septate, measuring 14–15 $\times$ 3 μm , and are colourless.

Specimens examined: Hungary, Vendvidék, Szakonyfalu, Szakonyi-erdő, 46° 54' 31.7" N, 16° 13' 31.6" E, ca 270 m, 26.12.2023, on tree bark on *Parmelia sulcata*, CSN 11998; Szakonyfalu, valley of Zsida-patak, 46° 54' 38.0" N, 16° 14' 47.4" E, ca 295 m, on the ground, on a fallen tree branch on *Parmelia sulcata*, CSN 12000, [BP 97251]. – Hungary, Zala Hills, Oltárc, surrounding Várdomb-forrás, 46° 31' 55.2" N, 16° 52' 49.2" E, ca 290 m, 13.07.2024, on the ground, on a fallen tree branch on *Parmelia sulcata*, CSN 12362, [BP 97252]. – Hungary, Balaton Uplands, Balatonfüred, Koloska-völgy, 46° 59' 09.3" N, 17° 53' 41.1" E, ca 240 m, 04.12.2023, on the trunk of a fallen tree on *Parmelia sulcata*, CSN 11967. Pécsely, Felső-erdő, 46° 57' 56.2" N, 17° 45' 19.0" E, ca 350 m, 19.10.2023, on tree bark on *Parmelia sulcata*, CSN 11836, [BP 97253]; ibid., 26.10.2023, on

the ground, on a fallen tree branch on *Parmelia sulcata*, CSN 11861. – Hungary, Pilis Mts, Esztergom, Lencse-völgy, 47° 44' 06.2" N, 18° 46' 45.2" E, ca 230 m, 24.08.2023, on the ground, on a fallen tree branch on *Parmelia sulcata*, CSN 11710, [BP 97254]. – Hungary, Börzsöny Mts, Nagyoroszi, Vár-bérc, 48° 00' 55.9" N, 19° 02' 28.1" E, ca 370 m, 31.08.2023, on the ground, on a fallen tree branch on *Parmelia sulcata*, CSN 11714, [BP 97255]. – Hungary, Cserhát Mts, Buják, Bokri-hegy, 47° 54' 36.6" N, 19° 33' 39.8" E, ca 290 m, 06.11.2023, CSN 11869; *ibid.*, on the ground, on a fallen tree branch on *Hypogymnia physodes* (L.) Nyl. (probably just an occasional host near infected *Parmelia sulcata*), 11.08.2023, CSN 11696; *ibid.*, on the ground, on a fallen tree branch on *Parmelia sulcata*, 11.08.2023, CSN 11692; *ibid.*, 29.06.2023, on the ground, on a fallen tree branch on *Parmelia sulcata*, CSN 11567/1 [BP 97256]. – Hungary, Bükkalja, Kisgyőr, Valley under Leső-hegy, 48° 00' 56.8" N, 20° 39' 24.4" E, ca 290 m, 16.11.2023, on the ground, on a fallen tree branch on *Parmelia sulcata*, CSN 11902; Kisgyőr, Pince-verő-hegy, 48° 01' 19.9" N, 20° 38' 48.3" E, ca 410 m, 16.11.2023, on the ground, on a fallen tree branch on *Parmelia sulcata*, CSN 11907, [BP 97257]; Cserépfalu, Karácsonytisztása, 47° 57' 59.3" N, 20° 32' 56.9" E, ca 310 m, 04.09.2023, on the ground, on a fallen tree branch on *Parmelia sulcata*, CSN 11719. – Hungary, Egercsehi Ózd Depression, Hevesaranyos, Pongrác-gödör, 47° 59' 36.7" N, 20° 12' 38.4" E, ca 335 m, 11.09.2024, on the ground, on a fallen tree branch on *Parmelia sulcata*, CSN 12481, [BP 97258]. – Hungary, Parád Recsk Depression, Sirok, Nyírjes-tó, 47° 55' 49.4" N, 20° 11' 07.6" E, ca 220 m, 11.09.2024, on the ground, on a fallen tree branch on *Parmelia sulcata*, CSN 12483, [BP 97259].

Paranectria oropensis (Ces.) D. Hawksw. et Piroz.

(Fig. 2C–D)

Paranectria oropensis has been documented to colonise a diverse array of host lichens (CEZANNE *et al.* 2008, HAFELLNER and OBERMAYER 2009, ROSSMAN *et al.* 1999). The species is distributed globally and has been reported from numerous countries (see literature in CANNON and MINTER 2019, HAFELLNER and OBERMAYER 2009).

The perithecia are superficial, subglobose, orange, with a tiny red-orange pointed apex. The ascospores are 22–36 × 9–12.5 µm in size, muriform, with 3–5 transverse and 1–2 longitudinal septa, and long, attenuated, slightly curved appendages.

Specimens examined: Hungary, Pilis Mts, Csobánka, Bükk-lyuk, 47° 39' 34.9" N, 18° 56' 19.7" E, ca 340 m, 18.04.2024, on bark of *Fraxinus ornus* L. on *Physcia adscendens* H. Olivier, *Physconia enteroxantha* (Nyl.) Poelt, and *Melanelixia glabratula* (Lamy) Sandler et Arup, CSN 12254, CSN 12255, [BP 97260],

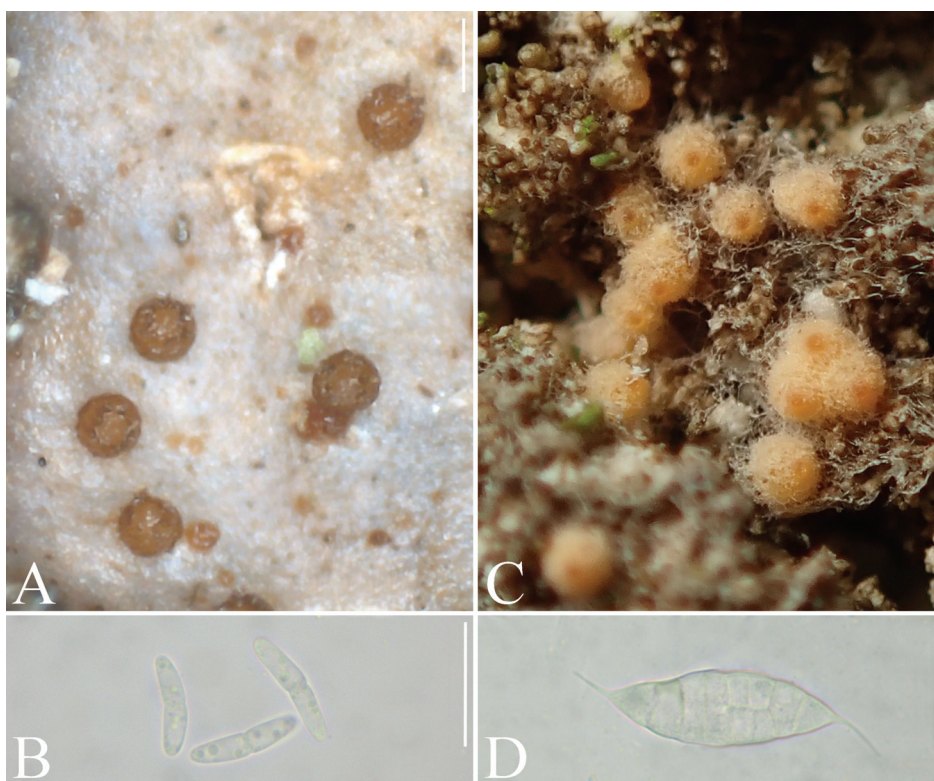


Fig. 2. Lichenicolous species. – A, B = *Nectriopsis rubefaciens*. A = Superficial perithecia growing on the thallus of *Parmelia sulcata*. B = Free ascospores. – C, D = *Paranectria oropensis*. C = Perithecia growing on the thallus of *Melanelixia glabratula*. D = Free ascospore. Scale bars: A = 100 µm; C = 500 µm; B, D = 20 µm (A = CSN 11710; B = CSN 11567/1; C, D = CSN 11978) (Photos by C. Németh).

CSN 12260, [BP 97261]. Pilisszántó, Hosszú-hegy, 47° 39' 51.2" N, 18° 55' 11.4" E, ca 480 m, 26.09.2024, on bark of *Fraxinus ornus* L. on *Physcia adscendens*, CSN 12503, [BP 97279]. – Hungary, Visegrád Mts, Pilisszentlászló, Tüskés-hegy, 47° 43' 09.0" N, 18° 57' 32.3" E, ca 485 m, 15.12.2023, on bark of *Quercus petraea* (Matt.) Liebl. on *Melanelixia glabratula*, CSN 11978, [BP 97262]. – Hungary, Buda Mts, Budapest, Nagy-Hárs-hegy, 47° 31' 49.1" N, 18° 57' 11.4" E, ca 400 m, 31.05.2024, on bark of *Fraxinus ornus* on *Melanelixia glabratula*, CSN 12314. – Hungary, Zala Hills, Oltárc, Vár-hegy, 46° 32' 14.3" N, 16° 52' 55.1" E, ca 340 m, 13.07.2024, on bark of *Acer campestre* L. on *Candelaria concolor* (Dicks.) Stein, CSN 12361, [BP 97263]. – Hungary, Somogy Hills, Ságvár, Börevár, 46° 48' 54.7" N, 18° 02' 38.5" E, ca 215 m, 12.10.2024, on bark of *Tilia tomentosa* Moench on *Physconia grisea* (Lam.) Poelt, CSN 12543.

Pronectria oligospora Lowen et Rogerson var. *octospora* Etayo
(Fig. 3A–B)

Pronectria oligospora var. *octospora* is confined to the host of the genus *Punctelia*, mainly to *P. subrudecta*, and known from several countries in Europe (LOWEN 1995, ETAYO 1998, KONDRATYUK *et al.* 2003, SÉRUSIAUX *et al.* 2003, VAN DER KOLK 2016, BRACKEL 2021).

The perithecia are orange to red and subglobose, largely immersed in the host thallus. The asci are eight-spored, the ascospores are $14\text{--}22 \times 5\text{--}6\ \mu\text{m}$ in size, ovoid, 1-septate, strongly constricted at the septum, smooth or finely warted.

Specimen examined: Hungary, Bakony Mts, Bakonyszentlászló, Alsó-Cuhaszurdok, $47^\circ 22' 44.3''\text{ N}$, $17^\circ 50' 03.9''\text{ E}$, ca 255 m, 29.09.2024, on bark of *Quercus cerris* L. on *Punctelia subrudecta* (Nyl.) Krog, CSN 12524, [BP 97280].

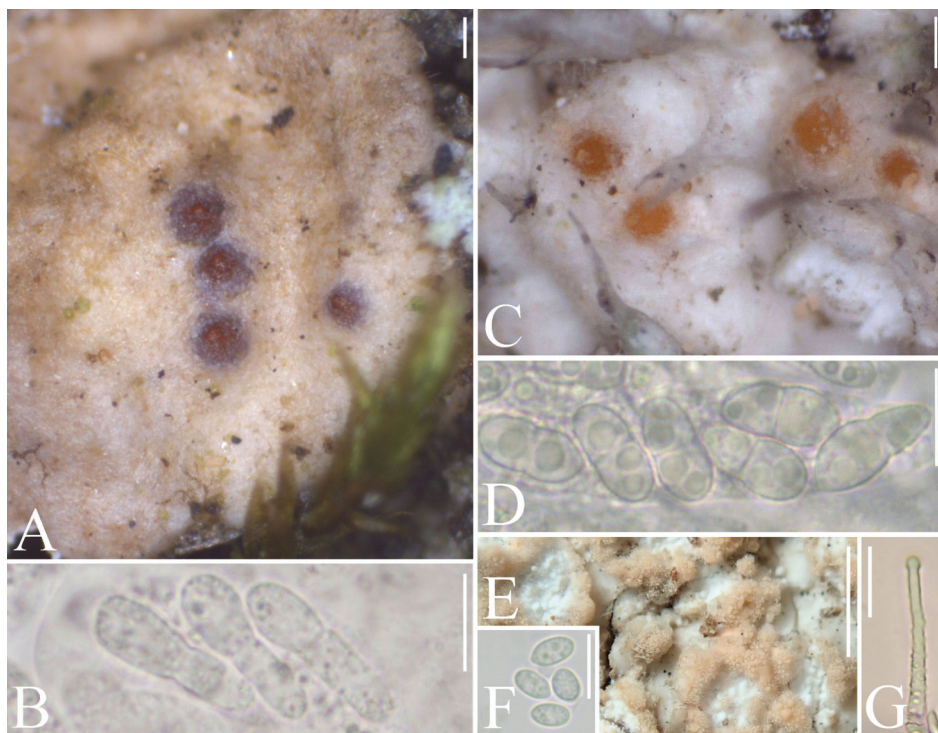


Fig. 3. Lichenicolous species. – A, B = *Pronectria oligospora* var. *octospora*. A = Perithecia immersed in the thallus of *Punctelia subrudecta*. B = Ascospores in ascus. – C, D = *Pronectria pertusariicola*. C = Perithecia immersed in the thallus of *Pertusaria albescens*. D = Ascospores in ascus. – E, F, G = Putative *Acremonium*-anamorph of *Pronectria pertusariicola*. E = Pink cushions of conidiophores growing on the thallus of *Pertusaria albescens*. F = Conidia. G = Conidiophore. Scale bars: A, C = $100\ \mu\text{m}$; B, D, F, G = $10\ \mu\text{m}$; E = $1\ \text{mm}$ (A, B = CSN 12524; C, D = CSN 12508; E, F, G = CSN 12525) (Photos by C. Németh).

Pronectria pertusariicola Lowen
(Fig. 3C–D)

Pronectria pertusariicola is confined to epiphytic *Pertusaria* species and known from Austria, Belgium, the Canary Islands, France, Great Britain, Ireland, Italy, Madeira, Slovakia, Spain, and Sweden (BRACKEL 2020, 2021, COPPINS and COPPINS 2000, ETAYO 1996, ETAYO and LÓPEZ DE SILANES 2024, FOX 2000, HAFELLNER 2003, MIHÁL 2011, ROSSMAN *et al.* 1999, SÉRUSIAUX *et al.* 2003).

The ascomata are orange and subglobose, immersed in the host thallus. The ascospores are $11\text{--}15 \times 5\text{--}6\text{ }\mu\text{m}$ in size, ovoid, 1-septate, and echinulate.

The putative *Acremonium*-anamorph of *Pronectria pertusariicola* described by BRACKEL (2021) was also observed in the Hungarian locality listed below (CSN 12525, Fig. 3E–G).

Specimen examined: Hungary, Bakony Mts, Bakonyszentlászló, Alsó-Cuha-szurdok, $47^{\circ} 22' 44.3''$ N, $17^{\circ} 50' 03.9''$ E, ca 255 m, 29.09.2024, on bark of *Quercus cerris* on *Pertusaria albescens* (Hudson) M. Choisy et Werner, CSN 12508, [BP 97276].

Xenonectriella septemseptata (Etayo) Etayo et van den Boom
(Fig. 4A–B)

Xenonectriella septemseptata is a widespread species reported from Italy (BRACKEL 2011), France (ROUX 2012), Germany (BRACKEL *et al.* 2012), Luxembourg (DIEDERICH *et al.* 2012), The Netherlands (VAN DER KOLK 2020), Austria, Spain (VAN DEN BOOM and ETAYO 2014), Switzerland (ZIMMERMANN and FEUSI 2021), and Ukraine (KONDRATYUK *et al.* 2022) on several hosts of the family Parmeliaceae (*Melanelia*, *Melanelixia*, *Melanohalea*, *Parmelia*, *Parmelina*, *Punctelia*) (BERGER *et al.* 2020, BRACKEL 2007, 2011, DARMOSTUK *et al.* 2021, ETAYO 1998, 2017, VAN DER KOLK 2020, ZIMMERMANN and FEUSI 2018, 2021). The Hungarian specimens were collected on *Melanelixia glabratula*.

The ascomata are red and semi-immersed in the thalli of the host lichen. The ascospores are spindle-shaped, $40\text{--}80\text{ }\mu\text{m}$ in length and $4\text{--}7\text{ }\mu\text{m}$ in width, with 3 to 7 transverse septa. They are hyaline, and sometimes pale brownish when mature (VAN DEN BOOM and ETAYO 2014).

Specimens examined: Hungary, Keszthely Mts, Rezi, Meleg-hegy, $46^{\circ} 51' 58.7''$ N, $17^{\circ} 14' 39.4''$ E, ca 335 m, 31.08.2024, on bark of *Fraxinus excelsior* L. on *Melanelixia glabratula*, CSN 12458. – Hungary, Bakony Mts, Bakonyszentlászló, Alsó-Cuha-szurdok, $47^{\circ} 22' 43.5''$ N, $17^{\circ} 50' 03.6''$ E, ca 250 m, 06.10.2024, on bark of *Fraxinus ornus* on *Melanelixia glabratula*, CSN 12523. – Hungary, Pilis Mts, Esztergom–Pilisszentlélek, Pilis-tető, $47^{\circ} 42' 15.1''$ N, $18^{\circ} 50' 56.9''$ E, ca

650 m, 08.02.2024, on bark of *Quercus petraea* on *Melanelixia glabratula*, CSN 12067, [BP 97264]. Csobánka, Bükk-lyuk, 47° 39' 34.8" N, 18° 56' 19.6" E, ca 340 m, 18.04.2024, on bark of *Fraxinus ornus* on *Melanelixia glabratula*, CSN 12262, [BP 97265]. Pilisszántó, Hosszú-hegy, 47° 39' 47.0" N, 18° 55' 23.1" E, ca 450 m, 26.09.2024, on bark of *Fraxinus ornus* on *Melanelixia glabratula*, CSN 12494, [BP 97277]. – Hungary, Visegrád Mts, Pilisszentlászló, Tüskés-hegy, 47° 43' 37.0" N, 18° 57' 51.8" E, ca 450 m, 20.02.2024, on bark of *Quercus petraea* on *Melanelixia glabratula*, CSN 12084, [BP 97266]; *ibid.*, 47° 43' 43.2" N, 18° 57' 56.0" E, ca 380 m, on bark of *Fagus sylvatica* on *Melanelixia glabratula*, CSN 12087; *ibid.*, 47° 43' 43.2" N, 18° 58' 06.0" E, ca 380 m, on bark of *Fagus sylvatica* on *Melanelixia glabratula*, CSN 12088, [BP 97267]. Visegrád, Apát-kúti-gerinc, 47° 45' 37.4" N, 19° 00' 01.0" E, ca 405 m, 25.04.2024, on bark of *Tilia cordata* Mill. on *Melanelixia glabratula*, CSN 12273, [BP 97268]; *ibid.*, 47° 45' 36.9" N, 19° 00' 01.4" E, ca 400 m, 23.08.2024, on bark of *Fraxinus excelsior* on *Melanelixia*

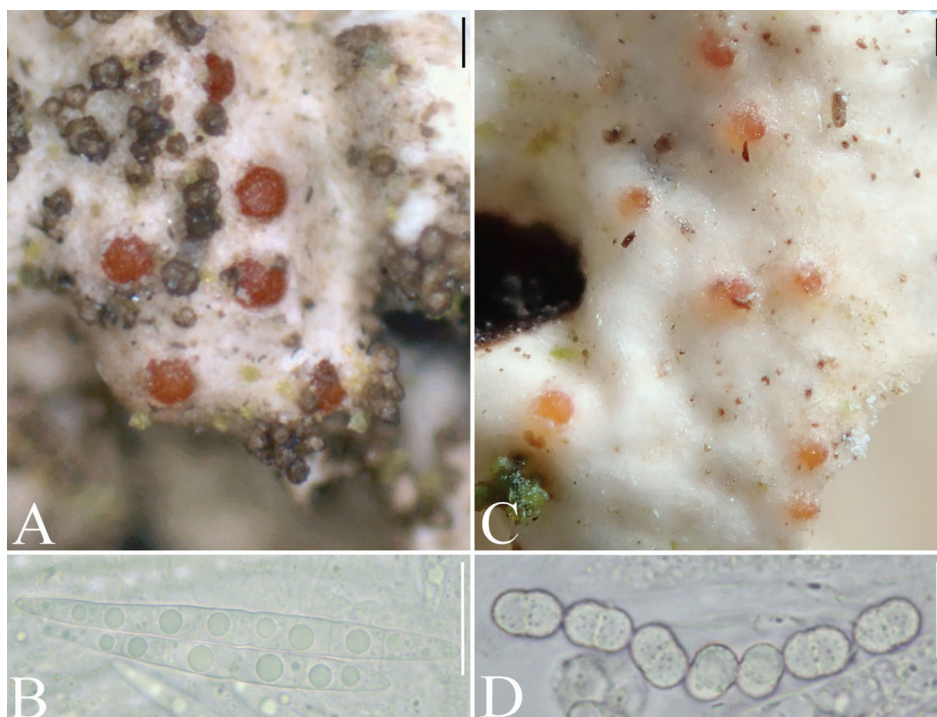


Fig. 4. Lichenicolous species. – A, B = *Xenonectriella septemseptata*. A = Ascomata growing immersed in the thallus of *Melanelixia glabratula*. B = Free ascospores. C, D = *Xenonectriella subimperspicua*. C = Perithecia immersed in the thallus of *Hypogymnia physodes*. D = Ascus with ascospores. Scale bars: A, C = 100 μ m; B = 20 μ m; D = 10 μ m (A, B = CSN 12067; C, D = CSN 12293) (Photos by C. Németh).

glabratula, CSN 12452, [BP 97269], CSN 12453. Visegrád, Urak-asztala, 47° 45' 09.2" N, 19° 00' 15.3" E, ca 575 m, 25.04.2024, on bark of *Fraxinus excelsior* on *Melanelixia glabratula*, CSN 12270, [BP 97270]. – Hungary, Cserhát Mts, Garáb, Nagy-Zsunyi-hegy, 47° 59' 38.8" N, 19° 38' 22.2" E, ca 445 m, 01.10.2024, on bark of *Acer pseudoplatanus* L. on *Melanelixia glabratula*, CSN 12512, [BP 97278]. – Hungary, Somogy Hills, Ságvár, surrounding of Börevár, 46° 48' 30.9" N, 18° 02' 41.6" E, ca 210 m, 12.10.2024, on bark of *Tilia tomentosa* on *Melanelixia glabratula*, CSN 12547.

***Xenonectriella subimperspicua* (Speg.) Etayo**
(Fig. 4C–D)

Xenonectriella subimperspicua is a widespread species that is restricted to genera of the family Parmeliaceae (*Hypotrachyna*, *Melanohalea*, *Parmelia*, *Parmelina*, *Parmotrema*, *Punctelia*) (BERGER *et al.* 2020, BRACKEL 2015, 2021) and it was found once on *Physcia tenella* (Scop.) DC. (Physciaceae) (BRACKEL 2014). In Hungary the species was collected on *Melanelixia glabratula* and *Hypogymnia physodes*.

Xenonectriella subimperspicua has been reported from Argentina, Brazil, Ecuador, Germany, India, New Zealand, Portugal, Spain, Switzerland, and Ukraine (BERGER *et al.* 2020, BRACKEL 2007, DARMOSTUK *et al.* 2021, ETAYO 2017, ETAYO and PÉREZ-ORTEGA 2016, MOTIEJŪNAITĖ and GROCHOWSKI 2014, ZHURBENKO 2013).

The ascomata are vividly orange to red and are immersed in the bleached host thallus. The ascospores are 1-septate, measuring 7–10 × 5–6 µm, and are broadly elliptical in shape. They are slightly constricted at the septum and exhibit a short echinulate ornamentation.

Specimens examined: Hungary, Bakony Mts, Bakonyszentlászló, Alízházierdő, 47° 19' 34.8" N, 17° 48' 02.5" E, ca 450 m, 14.03.2024, on bark of *Quercus petraea* on *Melanelixia glabratula*, CSN 12188, [BP 97271]. – Hungary, Pilis Mts, Csobánka, Bükk-lyuk, 47° 39' 32.3" N, 18° 56' 20.2" E, ca 340 m, 18.04.2024, on bark of *Fraxinus ornus* on *Melanelixia glabratula*, CSN 12258, [BP 97272]. Pilisszántó, Hosszú-hegy, 47° 39' 50.1" N, 18° 55' 09.4" E, ca 485 m, 26.09.2024, on bark of *Fraxinus ornus* on *Melanelixia glabratula*, CSN 12501. – Hungary, Visegrád Mts, Visegrád, Apát-kúti-gerinc, 47° 45' 37.4" N, 19° 00' 01.0" E, ca 405 m, 25.04.2024, on bark of *Tilia cordata* on *Melanelixia glabratula*, CSN 12272, [BP 97273]. Pilisszentlászló, between Akasztó-hegy and Nyesett-bérc, 47° 43' 25.2" N, 18° 56' 50.7" E, ca 535 m, 03.05.2024, on bark of *Quercus petraea* on *Hypogymnia physodes*, CSN 12293, [BP 97274]. – Hungary, Cserhát Mts, Garáb, Varjú-bérc, 47° 58' 53.5" N, 19° 38' 48.4" E, ca 410 m, 01.10.2024, on bark of

Quercus cerris on *Hypogymnia physodes*, CSN 12513. – Hungary, Somogy Hills, Ságvár, Börevár, 46° 48' 54.7" N, 18° 02' 38.5" E, ca 215 m, 12.10.2024, on bark of *Tilia tomentosa* on *Melanelixia glabratula*, CSN 12544.

* * *

Acknowledgements – I would like to thank my colleagues and friends Kornél Baráth, János Bölöni, Peter Erzberger, Veronika Csenge Horváth, Bence Kovács, Attila Mesterházy, Gábor Mézáros, András Schmotzer, László Máté Tálás, Katalin Veres, and Mátyás Wolf who were my companions in the field during the collecting trips. László Lőkös is acknowledged for valuable comments on the manuscript. I am also grateful to Alain Gardiennet and Christian Lechat (†) for helping to identify *Nectria muscivora*.

Összefoglaló: Nektrioid gombák alatt a *Nectria* nemzetséget és annak rokon nemzetségeit értjük, melyek zömében a Nectriaceae és a Bionectriaceae (Hypocreales, Sordariomycetes) családkba tartoznak. Többnyire szaprotróf vagy parazita (biotróf vagy nekrotróf) életmódot folytatnak, talajon, ürüléken (koprofil), mohákon (briofil) vagy zuzmókon (lichenikol) élnek. A zuzmólakók közül eddig csak egyetlen képviselőjük (*Pronectria robergei*) került elő Magyarországról, briofil nektrioid faj pedig egyáltalán nem volt ismert hazánkban. Jelen írás ezt az úrt igyekszik szűkíteni három mohaparazita és hat zuzmólakó faj első hazai adatainak közlésével. A briofil fajok közül a *Bryocentria brongniartii* esetében a *Frullania dilatata*, a *B. metzgeriae* esetében pedig a *Radula complanata* és a *Metzgeria furcata* májmohák voltak a gazdák, míg a *Nectria muscivora* a *Barbula unguiculata* és a *Didymodon cordatus* lombosmohákat parazitálta. A zuzmólakó *Paranectria oropensis* gazdazuzmói a *Candelaria concolor*, a *Physcia adscendens*, a *Physconia enteroxantha* és a *Melanelixia glabratula*, a *Nectriopsis rubefaciens*-é pedig a *Parmelia sulcata* és a *Hypogymnia physodes* voltak. A szintén lichenikol *Pronectria oligospora* *Punctelia subrudecta*, a *Pronectria pertusariicola* *Pertusaria albescens*, a *Xenonectriella septemseptata* *Melanelixia glabratula*, a *X. subimperspicua* pedig *Melanelixia glabratula* és *Hypogymnia physodes* zuzmótelepekről került elő.

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(submitted: 22.05.2024; accepted: 25.06.2024)