

# DISTRIBUTION OF *ABSCONDITELLA LIGNICOLA* (STICTIDACEAE, LICHENISED ASCOMYCETES) IN HUNGARY

E. FARKAS<sup>1</sup> and L. LÖKÖS<sup>2</sup>

<sup>1</sup>*Institute of Ecology and Botany, Centre for Ecological Research,  
H–2163 Vácraátót, Alkotmány u. 2–4, Hungary; farkas.edit@ecolres.hu*

<sup>2</sup>*Department of Botany, Hungarian Natural History Museum,  
H–1431 Budapest, Pf. 137, Hungary; lokos.laszlo@nhmus.hu*

Farkas, E. & Lökös, L. (2021): Distribution of *Absconditella lignicola* (Stictidaceae, lichenised Ascomycetes) in Hungary. – *Studia bot. hung.* 52(2): 115–124.

**Abstract:** *Absconditella lignicola* a tiny, rather inconspicuous lichen species was found in Hungary recently. During a short period more than 30 new localities were recorded, and it turned to be a widely distributed but still overlooked species. Distribution map of *Absconditella lignicola* in Hungary is presented, and its habitat preference is discussed.

**Key words:** *Absconditella*, distribution, floristics, Hungary, lichen-forming fungi, lignicolous

## INTRODUCTION

*Absconditella lignicola* is a crustose, primarily lignicolous (epixylic) lichen-forming fungus (Fig. 1). Thallus is thin, vivid or dark greenish-brownish, or inconspicuous, usually growing together with a gelatinous algal biocrust. Apothecia tiny (0.1–0.3 mm), pale waxy cream or ivory whitish, scattered, sessile, usually concave, urn-like. Paraphyses simple, 0.5–0.8  $\mu\text{m}$  wide. Asci 8-spored, with a distinct IKI– apical dome. Ascospores colourless, ellipsoid, 3-septate, 10.0–15.0  $\times$  4.5–6.5  $\mu\text{m}$  (Fig. 2). Photobiont chlorococcoid/trebouxoid. No lichen substances are present (see also SMITH *et al.* 2009, WIRTH *et al.* 2013).

*Absconditella lignicola* was described by Antonín Vězda and Ivan Pišút in 1985 from decorticated trunk of *Picea excelsa*, from spruce forest in the Tatra Mts (Slovakia) (VĚZDA and PIŠÚT 1985). They supposed that it might be a rather frequent species. It was also reported from many countries worldwide during the last 35 years (e.g. Austria (HAFELLNER 2000), Belarus (BELY 2012), British Isles (COPPINS 1994, CRITTENDEN 1994), Canada (MCMULLIN *et al.* 2015), Czech Republic (HALDA 1995, KOCOURKOVÁ-HORÁKOVÁ 1998, LIŠKA 1997, PALICE 1999, VĚZDA 1995), Estonia (HALONEN *et al.* 2000), Finland (SVENSSON *et al.* 2017), France (APTROOT *et al.* 2001, SIGNET and DIEDERICH 2003, VAN



Fig. 1. *Absconditella lignicola*, habit (scale = 500  $\mu\text{m}$ ).

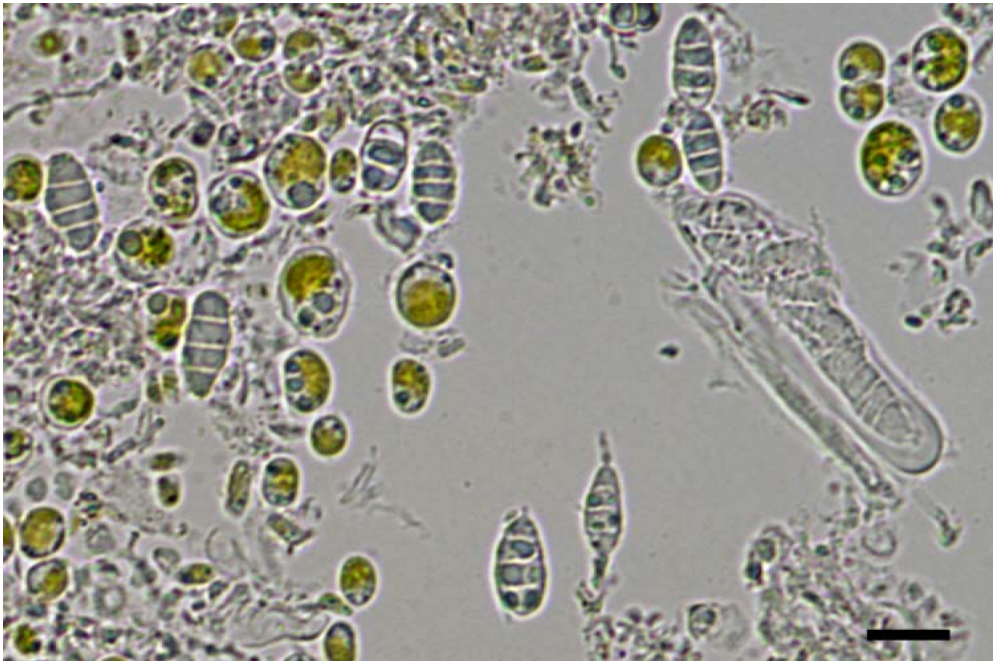


Fig. 2. *Absconditella lignicola*, 3-septate ascospores and algae (scale = 10  $\mu\text{m}$ ).

DEN BOOM *et al.* 1995), Germany (BRACKEL *et al.* 2018, EICHLER *et al.* (2010), GRÜNBERG *et al.* 2017, PALICE 1999, PÉREZ-ORTEGA, FERNÁNDEZ-MENDOZA 2009, SCHIEFELBEIN 2013), Italy (THOR and NASCIBENE 2007), Lithuania (MOTIEJŪNAITĖ 2016, MOTIEJUNAITE and ANDERSSON 2003), Netherlands (VAN DER KOLK *et al.* 2020), Norway (SVENSSON *et al.* 2017), Poland (BIELCZYK and KISZKA 2001, CZARNOTA and KUKWA 2007), Portugal (VAN DEN BOOM and GIRALT 1996), Russia (HIMELBRANT *et al.* 2018, PALICE 1999), Spain (PÉREZ-ORTEGA and FERNÁNDEZ-MENDOZA 2009), Sweden (SANTESSON 1993, SVENSSON *et al.* 2017), Tasmania (KANTVILAS 2005), Ukraine (KONDRATYUK and COPPINS 2000, COPPINS *et al.* 2005), US, Arizona (NASH *et al.* 1998)). Within Europe *Absconditella lignicola* is underrepresented in the Balkan countries (Fig. 3).

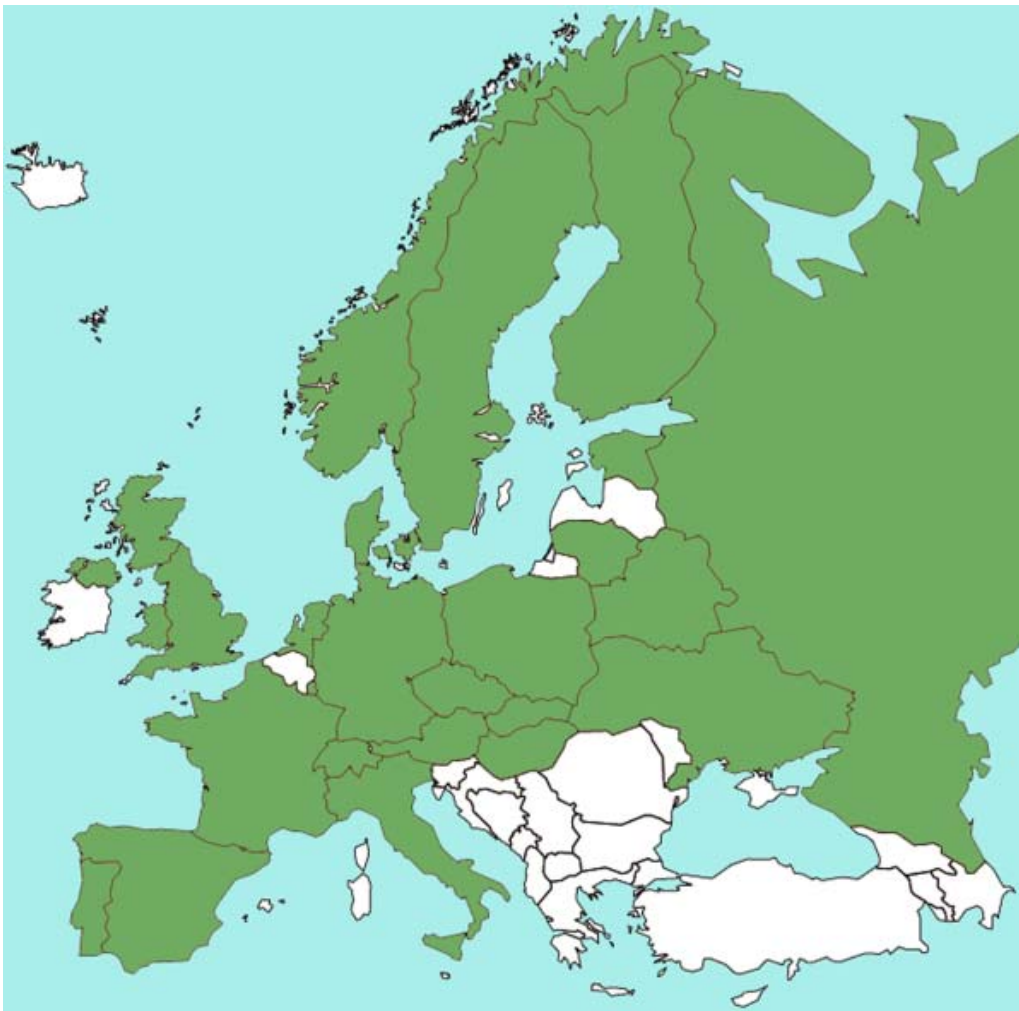


Fig. 3. Distribution of *Absconditella lignicola* in Europe (green = present in the country).

In the above studies *Absconditella lignicola* was found on decorticated, decaying wood of coniferous trees (*Larix* sp., *Picea abies*, *Pinus nigra*, *P. resinosa*, *P. strobus*, *P. sylvestris*) and in fewer cases on wood of deciduous trees (*Fagus sylvatica*, *Populus tremula*), or on moribund mosses, polypore fruit-body or *Peltigera* thalli accompanied by other lignicolous lichen species, i.e. *Catillaria erysiboides*, *Hypocenomyce scalaris*, *Micarea misella*, *M. peliocarpa*, *M. prasina*, *Placynthiella dasaea* and *Placynthiella icmalea*, *Thelocarpon lichenicola*.

*Absconditella lignicola* has been recently recognised also from Hungary under similar circumstances like in other countries. Our aim was to establish the current distribution and habitat diversity of the species within the country.

## MATERIAL AND METHODS

Voucher specimens are deposited in BP (Hungarian Natural History Museum, Budapest, Hungary). Morphological-anatomical investigations were carried out by Nikon SMZ18 stereo microscope and Nikon Eclipse/NiU compound microscope. Micrographs were prepared by Nikon Fi3 and DSFi1c camera with NIS-Elements BR ML software. The distribution map of *Absconditella lignicola* (Fig. 4) was prepared by the computer program for geographical information system, Quantum GIS (QGIS 3.18.1 Zürich, 2021) based on the Central European grid system of 5 km × 6 km units (BORHIDI 1984, NIKLFELD 1971). Nomenclature and taxonomy of lichen-forming fungi follow CABI (2021), and MycoBank (ROBERT *et al.* 2021).

## RESULTS AND DISCUSSION

### List of localities (by date of collection)

Hungary, Vas County, Őrség, Bajánsenye, in oak wood. Lat.: 46.822906° N; Long.: 16.403658° E; Alt.: 270 m a.s.l. Leg.: Lökös, L., 27.10.2009 [BP 96785].

Hungary, Hajdú-Bihar County, Nyírség, Bagamér, Kék-Kálló-völgy, Daru-hegyek, on bark (*Pinus sylvestris*). Lat.: 47.469444° N, Long.: 21.958194° E, Alt.: 125 m a.s.l. Leg.: Lökös, L., 01.06.2013 [BP 96786].

Hungary, Pest County, Csévharaszt, Buczka-erdő, rotten wood (*Pinus sylvestris*). Lat.: 47.291586° N, Long.: 19.385282° E, Alt.: 125 m a.s.l. Leg.: Lökös, L., 17.03.2021 [BP 96787].

Hungary, Budapest, 3rd district, Erdőhát út, Mt Remete-hegy, along the blue cross (+) tourist route, on rotten wood (*Pinus nigra*). Lat.: 47.540236° N, Long.: 19.015569° E, Alt.: 310 m a.s.l. Leg.: Farkas, E., Lökös, L., 21.03.2021 [BP 96788].

Hungary, Budapest, 3rd district, Feketesalak út, Mt Tábor-hegy, along the green cross (+) tourist route, on rotten wood (*Pinus nigra*). Lat.: 47.548347° N, Long.: 19.010771° E, Alt.: 390 m a.s.l. Leg.: Farkas, E., Lökös, L., 21.03.2021 [BP 96789].

Hungary, Bács-Kiskun County, near the 'Shepherds Museum', on decaying wood in a forest. Lat.: 46.660225° N; Long.: 19.611767° E; Alt.: ca 115 m a.s.l. Leg.: Lökös, L., 24.03.2021 [BP 96790].

Hungary, Pest County, Fót, SW foot of Mt Fóti-Somlyó, on decaying wood (*Pinus nigra*). Lat.: 47.627991° N; Long.: 19.205992° E; Alt.: 205 m a.s.l. Leg.: Farkas, E., Lőkös, L., 24.04.2021 [BP 96791].

Hungary, Somogy County, Somogyi-dombság, Szentai-erdő, ca 1 km WNW of Bolhás, on decaying wood (*Pinus sylvestris*). Lat.: 46.267845° N; Long.: 17.256286° E; Alt.: 150 m a.s.l. Coll.: Lőkös, L., 11.05.2021 [BP 96792].

Hungary, Pest County, Csévharaszt, 'Pótharaszt', on rotten wood (*Pinus sylvestris*). Lat.: 47.260927° N, Long.: 19.390523° E, Alt.: 130 m a.s.l. Leg.: Lőkös, L., 18.05.2021 [BP 96793].

Hungary, Zala County, Göcsej, Zalabaksa, Cser-hegy, Cser-hegy-erdő, Pap-kúti, on rotten wood (*Pinus sylvestris*). Lat.: 46.702605° N, Long.: 16.562831° E, Alt.: 185 m a.s.l. Leg.: Farkas, E., Lőkös, L., 12.06.2021 [BP 96794].

Hungary, Zala County, Göcsej, Lenti, Cser-hegy, Szemere-lakosi-dűlő, on rotten wood (*Pinus sylvestris*). Lat.: 46.685484° N, Long.: 16.584848° E, Alt.: 200 m a.s.l. Leg.: Farkas, E., Lőkös, L., 12.06.2021 [BP 96795].

Hungary, Heves County, Mátra Mts, Gyöngyösoroszi, Ércelőtelep, on decaying wood (*Pinus nigra*). Lat.: 47.839568° N; Long.: 19.884550° E; Alt.: 315 m a.s.l. Coll.: Farkas, E., Lőkös, L., 21.08.2021 [BP 96796].

Hungary, Nógrád County, Mátra Mts, Pásztó, Pelyhes-tető, on decaying wood (*Picea abies*). Lat.: 47.890847° N; Long.: 19.848576° E; Alt.: 660 m a.s.l. Coll.: Farkas, E., Lőkös, L., 21.08.2021 [BP 96797].

Hungary, Heves County, Mátra Mts, Mátraszentimre, Pelyhes-tető, on decaying wood (*Picea abies*). Lat.: 47.898425° N; Long.: 19.856612° E; Alt.: 735 m a.s.l. Coll.: Farkas, E., Lőkös, L., 21.08.2021 [BP 96798].

Hungary, Pest County, Börzsöny Mts, Szokolya, between the village and the railway station, on decaying wood (*Pinus sylvestris*). Lat.: 47.867623° N; Long.: 19.025763° E; Alt.: 215 m a.s.l. Coll.: Farkas, E., Lőkös, L., 04.09.2021 [BP 96799].

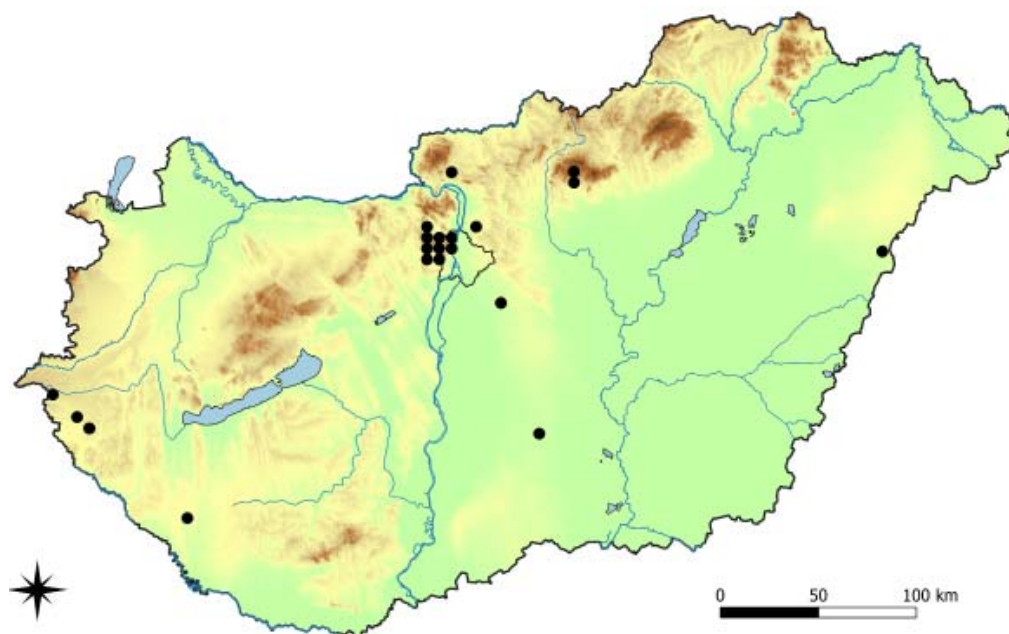


Fig. 4. Distribution of *Absconditella lignicola* in Hungary.

Hungary, Heves County, Mátra Mts, Gyöngyöstarján, along the green triangle tourist route from Borhy-kastély to Mt Világos-hegy, near 'Disznós-rét', on decaying wood (*Pinus sylvestris*). Lat.: 47.852853° N; Long.: 19.838678° E; Alt.: 480 m a.s.l. Coll.: Farkas, E., Lökös, L., 05.09.2021 [BP 96800].

Hungary, Pest County, Páty, Buda Mts, Fekete-hegyek, along the green triangle tourist route at Mt Nagy-Kopasz, on decaying wood (*Pinus nigra*). Lat.: 47.547529° N; Long.: 18.865868° E; Alt.: 540 m a.s.l. Coll.: Lökös, L., 18.09.2021 [BP 96801].

Hungary, Pest County, Páty, Buda Mts, Fekete-hegyek, along the green triangle tourist route at 'Tarnai-pihenő', on decaying wood (*Pinus nigra*). Lat.: 47.541905° N; Long.: 18.870052° E; Alt.: 440 m a.s.l. Coll.: Lökös, L., 18.09.2021 [BP 96802].

Hungary, Pest County, Páty, Buda Mts, along the green triangle tourist route, westernmost part of Mt 'Hosszú-hajtás-hegy', on decaying wood (*Pinus sylvestris*). Lat.: 47.517963° N; Long.: 18.863410° E; Alt.: 325 m a.s.l. Coll.: Lökös, L., 18.09.2021 [BP 96803].

Hungary, Pest County, Pilisszentiván, Buda Mts, Mt Fehér-hegy, on decaying wood (*Pinus nigra*). Lat.: 47.611183° N; Long.: 18.887191° E; Alt.: 260 m a.s.l. Coll.: Lökös, L., 09.10.2021 [BP 96804].

Hungary, Pest County, Solymár, Buda Mts, W of Mt Alsó-Zsíros-hegy, on decaying wood (*Pinus nigra*). Lat.: 47.592477° N; Long.: 18.900564° E; Alt.: 405 m a.s.l. Coll.: Lökös, L., 09.10.2021 [BP 96805].

Hungary, Pest County, Biatorbágy, Buda Mts, 'Biatorbágyi-erdő' near Mt Kőszörűkő-hegy, on decaying wood (*Pinus nigra*). Lat.: 47.472042° N; Long.: 18.881200° E; Alt.: 245 m a.s.l. Coll.: Lökös, L., 04.12.2021 [BP 96806].

Hungary, Budapest, 2nd district, Szépvölgy, Buda Mts, W side of Mt Látó-hegy, on decaying wood (*Pinus nigra*). Lat.: 47.534988° N; Long.: 18.996268° E; Alt.: 360 m a.s.l. Coll.: Lökös, L., 30.01.2022 [BP 96807].

Hungary, Budapest, 2nd district, Szépvölgy, Buda Mts, W side of Mt Látó-hegy, on decaying wood (*Pinus nigra*). Lat.: 47.536261° N; Long.: 18.993696° E; Alt.: 300 m a.s.l. Coll.: Lökös, L., 30.01.2022 [BP 96808].

Hungary, Pest County, Budakeszi, Buda Mts, Csíki-hegyek, along the yellow line tourist route at 'Sorrento', on decaying wood (*Pinus nigra*). Lat.: 47.479340° N; Long.: 18.932155° E; Alt.: 290 m a.s.l. Coll.: Lökös, L., 05.02.2022 [BP 96809].

Hungary, Pest County, Budakeszi, Buda Mts, Csíki-hegyek, 'Sorrento' path, near 'Sinka Lajos-empléktábla', on decaying wood (*Pinus nigra*). Lat.: 47.480474° N; Long.: 18.937084° E; Alt.: 350 m a.s.l. Coll.: Lökös, L., 05.02.2022 [BP 96810].

Hungary, Pest County, Budakeszi, Buda Mts, Csíki-hegyek, 'Sorrento' path, on decaying wood (*Pinus nigra*). Lat.: 47.481329° N; Long.: 18.938782° E; Alt.: 360 m a.s.l. Coll.: Lökös, L., 05.02.2022 [BP 96811].

Hungary, Pest County, Budakeszi, Buda Mts, Csíki-hegyek, 'Sorrento' path, on decaying wood (*Pinus nigra*). Lat.: 47.481145° N; Long.: 18.940606° E; Alt.: 360 m a.s.l. Coll.: Lökös, L., 05.02.2022 [BP 96812].

Hungary, Budapest, 12th district, Csillebérc, Buda Mts Mt, along Konkoly Thege Miklós út, on decaying wood (*Pinus sylvestris*). Lat.: 47.483412° N; Long.: 18.946435° E; Alt.: 385 m a.s.l. Coll.: Lökös, L., 05.02.2022 [BP 96813].

Hungary, Budapest, 3rd district, Hármashatárhegy, Buda Mts, along Erdőalja út, on decaying wood (*Pinus sylvestris*). Lat.: 47.565999° N; Long.: 18.996864° E; Alt.: 260 m a.s.l. Coll.: Lökös, L., 06.02.2022 [BP 96814].

Hungary, Budapest, 3rd district, Hármashatárhegy, Buda Mts, E side of Mt Tábor-hegy, along green 'cave' sign near the cave 'Tábor-hegyi-barlang', on decaying wood (*Pinus nigra*). Lat.: 47.549702° N; Long.: 19.012149° E; Alt.: 320 m a.s.l. Coll.: Lökös, L., 06.02.2022 [BP 96815].

Hungary, Budapest, 3rd district, Hármashatárhegy, Buda Mts, Mt Hármashatár-hegy, “Buszforduló” at the end of Hármashatár-hegyi út, on decaying wood (*Pinus nigra*). Lat.: 47.556525° N; Long.: 19.002015° E; Alt.: 450 m a.s.l. Coll.: Lőkös, L., 06.02.2022 [BP 96816].

*Absconditella lignicola* a tiny, rather inconspicuous lichen species has been recently recognised also from Hungary under similar circumstances like in other countries. Since the first specimen was found in 2009 in the Örség (W Hungary), it has been collected from several (more than 30) localities in the Börzsöny, Buda and Mátra Mts, in the Danube–Tisza Interfluve, the Transdanubian Hills, the Nyírség and the Örség (Fig. 4).

Hungarian specimens were collected from decaying wood of *Picea abies*, *Pinus nigra* and *Pinus sylvestris* (Figs 5–6) both in montane and lowland habitats, most often in lowland pine plantations, but also in seminatural forests, accompanied by *Micarea denigrata*, *Placynthiella icmalea*, and *Trapeliopsis flexuosa*.

Considering the numerous recent occurrences *Absconditella lignicola* is evaluated hereby as a widely distributed but still overlooked species in Hungary.

\* \* \*

*Acknowledgements* – Our work was supported by the project NKFI K 124341 financed by the Hungarian National Research Development and Innovation Fund.



**Fig. 5.** Typical habitat of *Absconditella lignicola*, lowland pine plantations with fallen, decaying trunks.



Fig. 6. Typical substrate of *Absconditella lignicola*, a strongly decaying coniferous trunk.



Fig. 7. Typical substrate of *Absconditella lignicola*, a strongly decaying coniferous wood with a gelatinous algal biocrust.

## REFERENCES

- APTROOT, A., SPARRIUS, L., VAN HERK, K. and DE BRUYN, U. (2001): Origin and distribution of recently described lichens from the Netherlands. – *Aktuelle Lichenol. Mitteil.*, NF 5: 13–25.
- BELY, P. (2012): *Absconditella lignicola* (Stictidaceae) – lichen species new to Belarus. (*Absconditella lignicola* (Stictidaceae) – nauja kerpių rūšis Baltarusijoje). – *Bot. Lith.* 18(2): 164–165.



- BIELCZYK, U. and KISZKA, J. (2001): The genus *Absconditella* (Stictidaceae, Ascomycota lichenisati) in Poland. – *Polish Bot. J.* **46**(2): 175–181.
- BORHIDI, A. (1984): Role of mapping the flora of Europe in nature conservation. – *Norrinia* **2**: 87–98.
- BRACKEL, W. v., CEZANNE, R., EICHLER, M., FEUERER, T., GNÜCHTEL, A., HOHMANN, M.-L., OTTE, V., SCHULTZ, M. and TÜRK, R. (2018): Lichens and lichenicolous fungi recorded during the excursion of the Bryologisch-lichenologische Arbeitsgemeinschaft für Mitteleuropa (BLAM) 2014 in Ettal, supplemented by lichen data from surrounding areas. (Lichenologische Ergebnisse der Jahresexkursion 2014 der BLAM in Ettal, ergänzt um weitere Flechtendaten aus der Umgebung von Garmisch-Partenkirchen). – *Herzogia* **31**(2): 893–930.  
<https://doi.org/10.13158/heaia.31.2.2018.893>
- CABI (2021): *The Index Fungorum*. – <http://www.indexfungorum.org> (accessed 5 May 2021).
- COPPINS, B. J. (1994): *Absconditella lignicola* Vězda & Pišút. In: HITCH, C. J. B. (ed.): New, rare and interesting British lichen records. – *Bull. Brit. Lichen Soc.* **74**: 54.
- COPPINS, B. J., KONDRATYUK, S. Y., KHODOSOVTSSEV, A. Y., ZELENKO, S. D. and WOLSELEY P. A. (2005): Contribution to lichen flora of Ukrainian Carpathians. – *Chornom. Bot. J.* **1**(2): 5–23.
- CRITTENDEN, P. D. (ed.) (1994): *British Lichen Society Bulletin. No. 74. Summer 1994*. – British Lichen Society, London, 80 pp.
- CZARNOTA, P. and KUKWA, M. (2008): Contribution to the knowledge of some poorly known lichens in Poland. I. The genus *Absconditella*. – *Folia Cryptog. Estonica* **44**: 1–7.
- EICHLER, M., CEZANNE, R. and TEUBER, D. (2010): Ergänzungen zur Liste der Flechten und flechtenbewohnenden Pilze Hessens. Zweite Folge. – *Bot. u. Natursch. in Hessen* **23**: 89–110.
- GRÜNBERG, H., CEZANNE, R., ECKSTEIN, J., EICHLER, M., KEMPF, H., MEINUNGER, L., PREUSING, M., PUTZMANN, F., SCHOLZ, P., THIEL, H., THIEMANN, R. and HENTSCHEL, J. (2017): New and remarkable lichen records for the federal state of Thuringia. (Neue und bemerkenswerte Flechtenfunde in Thüringen). – *Herzogia* **30**(2): 463–482.  
<https://doi.org/10.13158/heaia.30.2.2017.463>
- HAFELLNER, J. (2000): Zur Biodiversität lichenisierter und lichenicoler Pilze in den Eisenerzer Alpen (Steiermark). – *Mitt. Naturwiss. Vereines Steiermark* **130**: 71–106.
- HALDA, J. (1999): Prispevek k poznáni lichenoflóry Orlický'ch hor. 2. Údoli horních toků rek Belé, Zdobnice a Divoké Orlice. – *Acta Mus. Richnov., sect. natur.* **6**(1): 1–32.
- HALONEN, P., KUKWA, M., MOTIEJUNAITE, J., LOHMUS, P. and MARTIN, L. (2000): Notes on lichens and lichenicolous fungi found during the XIV Symposium of Baltic Mycologists and Lichenologists in Järvselja, Estonia. (Samblike ja lihhenikoolsete seente leidudest XIV Balti Mükoloogide ja Lihhenoloogide Sümpoosiumil Järvseljal, Eestis). – *Folia Cryptog. Estonica* **36**: 17–21.
- HIMELBRANT, D. E., EFIMOVA, A. A., KHANOV, Z. M., LEOSTRIN, A. V., MAKRYI, T. V. and STEPANCHIKOVA, I. S. (2018): New records of lichens and lichenicolous fungi. 1. (Новые находки лишайников и лихенофильных грибов. 1). – *Novosti Sist. Nizsh. Rast.* **52**: 445–453.
- KANTVILAS, G. (2005): Two ephemeral species of the lichen genus *Absconditella* (Stictidaceae) new to Tasmania. – *Muelleria* **21**: 91–95.
- KOCOURKOVÁ-HORÁKOVÁ, J. (1998): Records of new, rare or overlooked lichens from the Czech Republic. – *Czech Mycol.* **50**(3): 223–239.
- KONDRATYUK, S. Y. and COPPINS, B. J. (2000): Basement for the lichen monitoring in Uzhansky National Nature Park, Ukrainian part of the Biosphere Reserve 'Eastern Carpathians'. – *Roczn. Bieszczadz.* **8**: 149–192.
- LIŠKA, J. (1997): The list of lichens collected during the 9th Bryological-Lichenological Days. – *Bryonora* **20**: 19–21.

- McMULLIN, R. T., MALOLES, J. R. and NEWMASER, S. G. (2015): New and interesting lichens from Ontario, Canada II. – *Opusc. Philolich.* **14**: 93–108.
- MOTIEJŪNAITĖ, J. (2016): Žiauberiškosios kerpės. (Fungi lichenisati). – *Lietuvos Grybai* **13**(2): 1–456.
- MOTIEJŪNAITĖ, J. and ANDERSSON, L. (2003): Contribution to the Lithuanian flora of lichens and allied fungi. [Papildomi duomenys apie Lietuvos kerpių ir su jomis susijusių grybų flora]. – *Bot. Lith.* **9**(1): 71–88.
- NASH, TH. III, RYAN, B. D., DAVIS, W. C., BREUSS, O., HAFELLNER, J., LUMBSCH, H. T., TIBELL, L. and FEUERER, T. (1998): Additions to the lichen flora of Arizona IV. – *Bryologist* **101**(1): 93–99. <https://doi.org/10.2307/3244078>
- NIKLFIELD, H. (1971): Bericht über die Kartierung der Flora Mitteleuropa. – *Taxon* **20**(4): 545–571. <https://doi.org/10.2307/1218258>
- PALICE, Z. (1999): New and noteworthy records of lichens in the Czech Republic. – *Preslia* **71**: 289–336.
- PÉREZ-ORTEGA, S. and FERNÁNDEZ-MENDOZA, F. (2009): Two interesting new records for the Spanish lichen flora. – *Bot. Complutensis* **33**: 5–6.
- ROBERT, V., STALPERS, J. and STEGEHUIS, G. (2018): *Mycobank, the fungal website*. – <http://www.mycobank.org/DefaultPage.aspx> (accessed 5 May 2021).
- SANTESSON, R. (1993): *The lichens and lichenicolous fungi of Sweden and Norway*. – SBT-förlaget, Lund.
- SCHIEFELBEIN, U. (2013): Additions to the lichenized and lichenicolous fungi of Mecklenburg-Western Pomerania (Germany). – *Herzogia* **26**: 65–72. <https://doi.org/10.13158/heia.26.1.2013.65>
- SIGNORET, J. and DIEDERICH, P. (2003): Inventaire des champignons lichénisés et lichénicoles de la Réserve Naturelle des rochers et tourbières du Pays de Bitche. – *Ann. sci. Rés. Biosph. transfront. Vosges du Nord – Pfälzerwald* **11**: 193–222.
- SVENSSON, M., EKMAN, S., KLEPSLAND, J. T., NORDIN, A., THOR, G., VON HIRSCHHEYDT, G., JONSSON, F., KNUTSSON, T., LIF, M., SPRIBILLE, T. and WESTBERG, M. (2017): Taxonomic novelties and new records of Fennoscandian crustose lichens. – *MycKeys* **25**: 51–86. <https://doi.org/10.3897/mycokeys.25.13375>
- THOR, G. and NASCIMBENE, J. (2007): A floristic survey in the Southern Alps: additions to the lichen flora of Italy. – *Cryptog. Mycol.* **28**: 247–260.
- VAN DEN BOOM, P. P. G. and GIRALT, M. (1996): Contribution to the flora of Portugal, lichens and lichenicolous fungi I. – *Nova Hedwigia* **63**(1–2): 145–172.
- VAN DEN BOOM, P. P. G., ETAYO, J. and BREUSS, O. (1995): Interesting records of lichens and allied fungi from the Western Pyrenees (France and Spain). – *Cryptogamie, Bryol.-Lichénol.* **16**(4): 263–283.
- VAN DER KOLK, H., APTROOT, A., VERBOOM, L. and SPARRIUS, L. B. (2020): Veertien soorten korstmossen nieuw in Nederland. – *Buxbaumia* **119**: 60–68.
- VĚZDA, A. (1995): *Lichenes rariores exsiccati. Fasciculus vicessimus (numerus 191–200)*. – Sumpt. auct., Brno.
- VĚZDA, A. and PIŠŮT, I. (1985): Zwei neue Arten der Flechtengattung Absconditella (lichenisierte Stictidaceae, Ostropales) in der Tschechoslowakei. – *Nova Hedwigia* **40**: 341–346. (1984)

(submitted: 15.10.2021; accepted: 10.12.2021)