

VEZDAEA COBRIA (VEZDAEACEAE) A MINUTE BRYICOLOUS LICHENIZED ASCOMYCETE NEW TO HUNGARY

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Németh, C. (2023): *Vezenia cobria* (Vezeniaeaceae) a minute bryicolous lichenized ascomycete new to Hungary. – *Studia bot. hung.* 54(1): 85–91.

Abstract: *Vezenia cobria*, a lichenized fungus grows on living or moribund gametophyte of various bryophytes, but also on algal films and soil. Because of its extremely minute size *V. cobria* is an infrequently collected and probably overlooked species, which has hitherto been published only from the United Kingdom, the Czech Republic, Germany, France, and Alaska (USA). In this paper its first observation is reported in Hungary from the Bakony and Bükk Mts, where it was collected on steep, N-facing, nearly vertical, leached banks.

Key words: epibryophytic, goniocyst, lichen-forming fungi

INTRODUCTION

Vezeniaeaceae Poelt et Vězda ex J. C. David et D. Hawksw. is a monotypic family including a single genus, *Vezenia* Tscherm.-Woess et Poelt, which comprises 14 species of lichenized fungi (GIRALT *et al.* 1993, APTROOT and SPARRIUS 2003, LENDEMER 2011, KONDRATYUK *et al.* 2017). Seven of them are present in Europe (GIRALT *et al.* 1993), and only 1 species, *V. retigera* has so far been published to occur in Hungary (NÉMETH and ECKSTEIN 2018).

MATERIAL AND METHODS

Most of the microscopic observations were carried out on specimens immersed in water, but paraphyses and hyphae enclosing algal cells 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 microscope software. The nomenclature of ascomycetes and bryophytes follows the Index Fungorum as well as ERZBERGER and PAPP (2020), respectively. The occurrences were displayed in a grid-cell map based on the Central European Mapping Scheme ('KEF', 5' × 3' = ca 5.5 × 6.5 km). Voucher specimens have been

deposited in the private collection of the author (CSN) and the lichen herbarium of the Hungarian Natural History Museum, Budapest, Hungary (BP).

RESULTS AND DISCUSSION

While studying the cryptogamic communities of steep, acidic banks in the Bakony and Bükk Mts in spring 2023, a tiny *Vezdaea* species with whitish, hemispherical apothecia was collected. It was found growing abundantly on shoots of bryophytes as well as jelly-like algal films among them (Fig. 1a–b). Based on the subsequent comparative microscopic studies the above-mentioned collections proved to be *V. cobria*, a rarely reported bryophyte-associated lichen species, new to the Hungarian lichen flora.

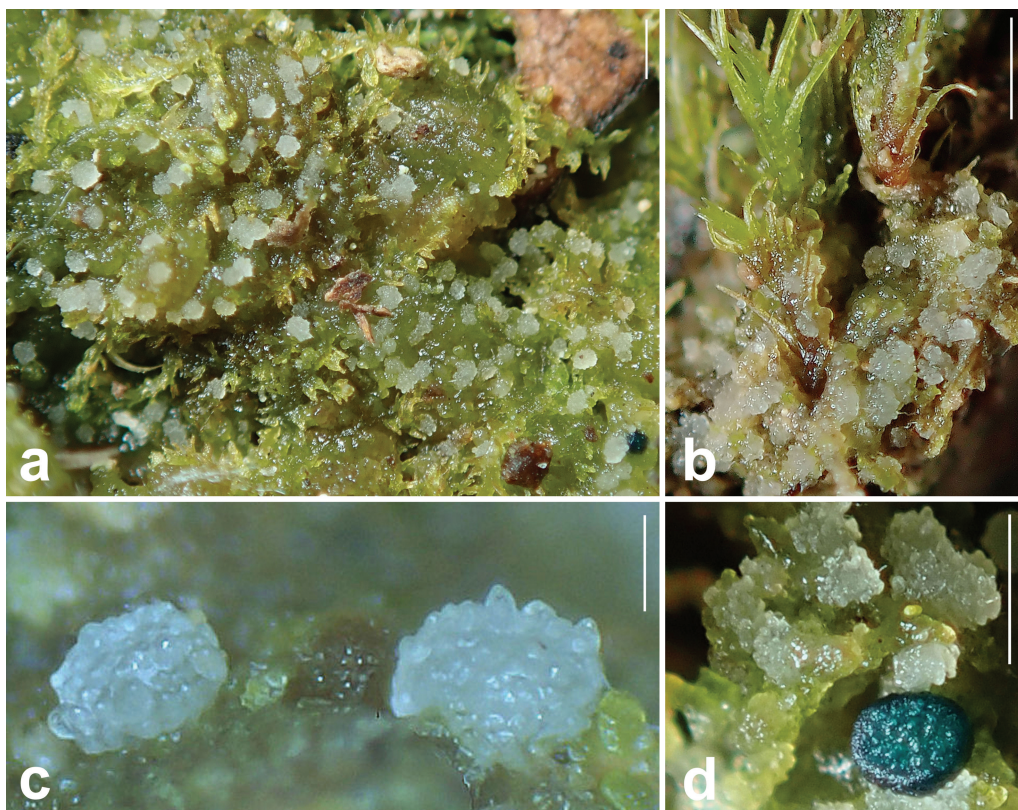


Fig. 1. Ascocarps of *Vezdaea cobria*. – a = Plenty of minute crystalline-white apothecia growing on *Cephaloziella divaricata* covered by algal coat. – b = Apothecia growing on the base of shoots of *Dicranella heteromalla*. – c = Apothecia showing the characteristic protruding ascus apices. – d = *Vezdaea cobria* associated with *Cephalozia bicuspidata* and *Mniaecia jungermanniae*, an obligate bryophilous fungus growing on leafy liverworts of the order Jungermanniales. Scale bars a, b, d = 0.5 mm, c = 0.1 mm (a, d = CSN 11406, b, c = CSN 11455). (Photos by C. Németh).

Specimens examined

Hungary, Bakony Mts, Farkasgyepű, Köves-patak Valley, 47° 11' 29.7" N, 17° 36' 28.2" E, ca 327 m, 18.03.2023, on acidic soil of steep stream bank, CSN 11406, BP 98141, leg. and det. C. Németh, [8871.2].

Hungary, Bükk Mts, Miskolc (Lillafüred), Mt Borovnyák-tető, 48° 06' 05.8" N, 20° 30' 05.1" E, ca 830 m, 13.04.2023, on acidic soil of steep forest road bank, CSN 11455, BP 98142, leg. and det. C. Németh, [7889.3].

Description

Thallus subleprose, consisting of small green goniocysts 9–16 (–19) μm in diameter, containing a single algal cell (*Leptosira*), the surface with short spines 4–6 μm high (Fig. 2). Apothecia very minute, white, sessile, mostly 0.1–0.25 mm across, with an irregular surface caused by protruding ascus apices (Fig. 1c).

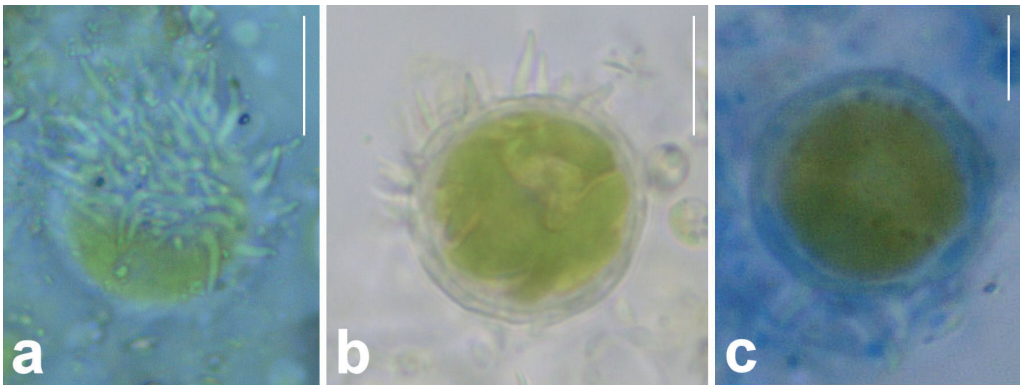


Fig. 2. Photobiont (*Leptosira*) of *Vezdaea cobria*. Goniocyst with spiny papillae containing a single algal cell and tightly enclosed by hyphae. Scale bars a–b = 10 μm , c = 5 μm (a = CSN 11455, b–c = CSN 11406), (c = stained with Lactophenol Cotton Blue). (Photos by C. Németh).

Paraphyses thin, 1–1.5 μm wide, branched and anastomosing, closely entwining the individual asci (Fig. 3a–b). Asci cylindrical, thick-walled, 8-spored, 80–120 μm long and 25–35 μm wide at the widest part (Fig. 3c–d). Ascospore smooth, 1-septate (rarely 2–3 septate spores are also reported, GIRALT *et al.* 1993), occasionally \pm asymmetric, and slightly curved, variable in shape, somewhat constricted at the septa, 22–28 (–30) \times 8–11 (–13) μm (Fig. 4).

Ecology

Vezdaea cobria is an ephemeral lichenized fungus growing in damp habitat on living, dying and dead bryophytes, algal films as well as plant debris

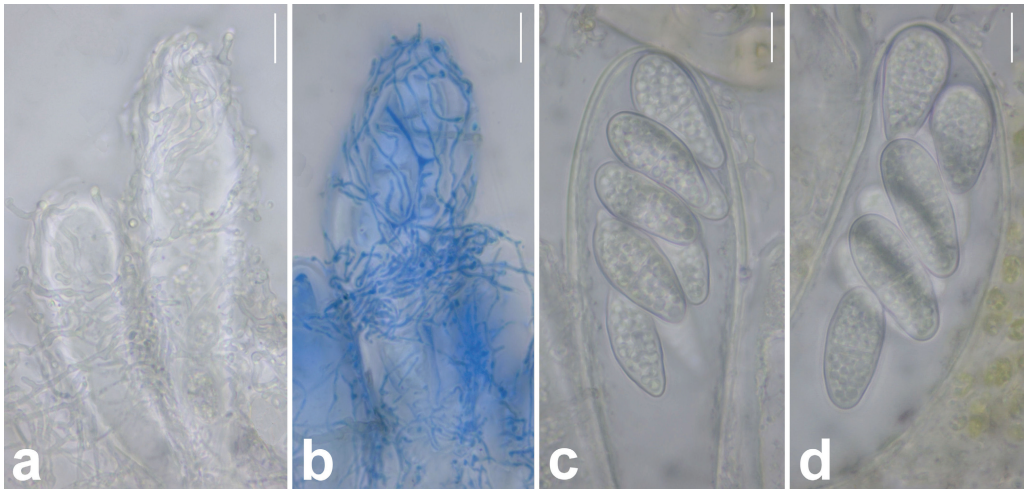


Fig. 3. Asci and paraphyses of *Vezdaea cobria* (CSN 11406). – a–b = Anastomosing paraphyses clasp ing the asci. – c–d = Thick-walled asci with ascospores inside. Scale bars a–d = 10 μ m, (b = stained with Lactophenol Cotton Blue) (Photos by C. Németh).

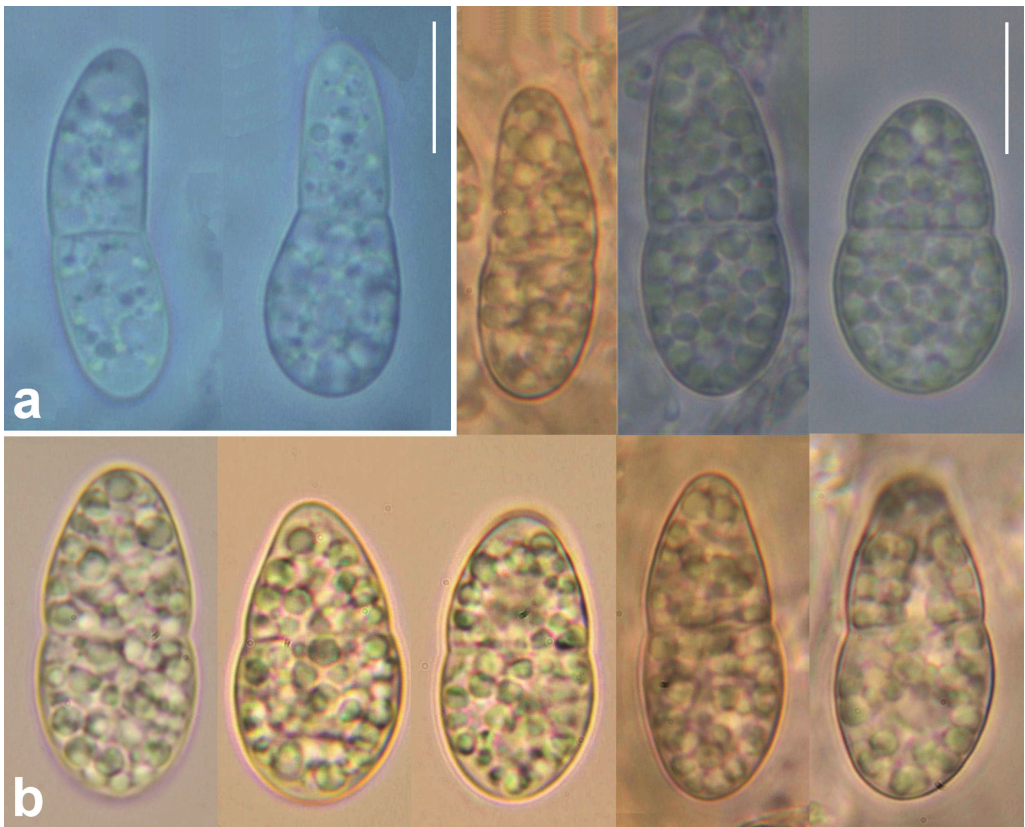


Fig. 4. Variability of spore morphology of *Vezdaea cobria*. Scale bars = 10 μ m (a = CSN 11455, b = CSN 11406). (Photos by C. Németh).

(CHAMBERS *et al.* 2021). In Hungary it occurs on steep, north-facing, nearly vertical, leached banks (Fig. 5), being associated with various acidophilous bryophytes, e.g. *Bartramia pomiformis* Hedw., *Blepharostoma trichophyllum* (L.) Dumort., *Cephalozia bicuspidata* (L.) Dumort., *Cephaloziella divaricata* (Sm.) Schiffn., *Dicranella heteromalla* (Hedw.) Schimp., *Diphyscium foliosum* (Hedw.) D. Mohr, *Lepidozia reptans* (L.) Dumort., *Syzygiella autumnalis* (DC.) K. Feldberg, Váňa, Hentschel et Heinrichs, in addition to some lichen species, such as the congener *Vezdaea rheocarpa* Poelt et Döbbele and *Thrombium epigaeum* (Pers.) Wallr. At one of the Hungarian localities, the non-lichenized obligate bryophilous *Mniaecia jungermanniae* (Fr.) Boud. was also observed to occur with *V. cobria* (Fig 1d). This association is mentioned by LAGRANDE (2016) and CHAMBERS *et al.* (2021) as well.

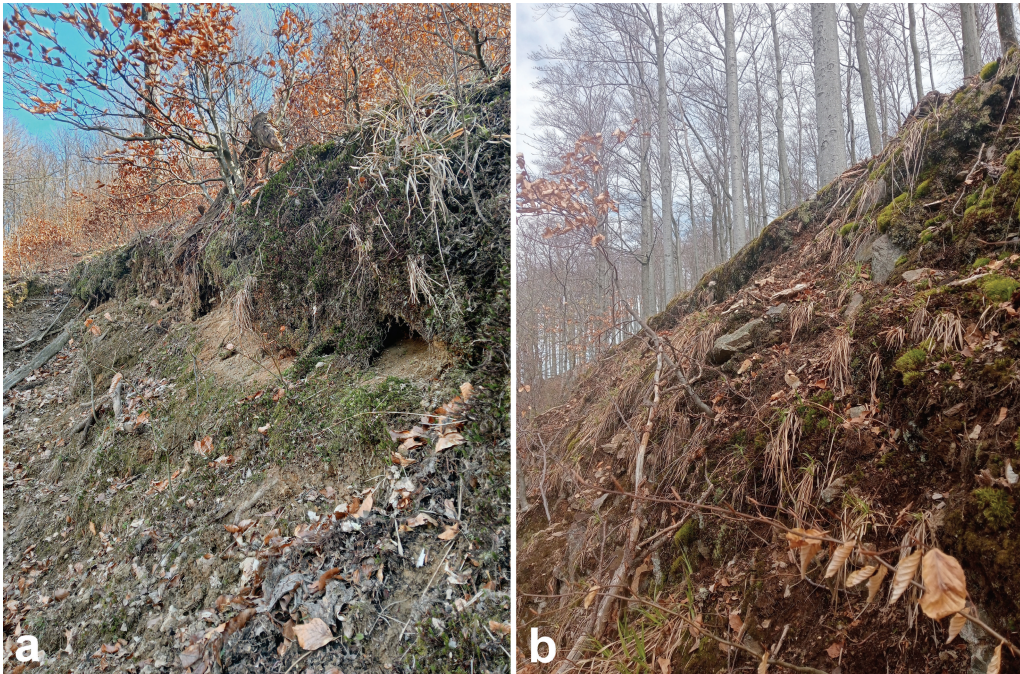


Fig. 5. Habitat of *Vezdaea cobria* in Hungary. – a = Köves-patak Valley in the Bakony Mts. – b = Mt Borovnyák-tető in the Bükk Mts. (Photos by C. Németh).

Differentiating from similar taxa

Vezdaea cobria differs from all other European members of *Vezdaea* having 1-septate spores (*V. aestivalis*, *V. leprosa*, *V. stipitata*) in having smaller ascocarps (0.1–0.25 mm vs. 0.3–1 mm) and larger ascospores ($20\text{--}28 \times 8\text{--}11 \mu\text{m}$ vs. $10\text{--}19$

$\times 2.5\text{--}7\ \mu\text{m}$). Furthermore, *V. stipitata* has poorly developed paraphyses (well developed and abundant in *V. cobria*), while paraphyses of *V. leprosa* are flexuose and do not entwine the asci. Additionally, apothecia of *V. leprosa* are distinctly stalked (sessile in *V. cobria*).

Distribution

Vezdaea cobria was described from Austria, Wales, and England (GIRALT *et al.* 1993), and since has been reported only from the United Kingdom (CHAMBERS *et al.* 2021), the Czech Republic (PALICE *et al.* 2007), Germany (LUMBSCH *et al.* 2009, ZIMMERMANN *et al.* 2011), France (LAGRANDIE 2016), and very recently from Alaska, USA (SPRIBILLE *et al.* 2020).

Because of the inconspicuous thalli, the extremely minute and ephemeral character of apothecia, species of *Vezdaea* have probably been overlooked and under-recorded. This may be especially true for *V. cobria*, the tiniest representative of the genus.

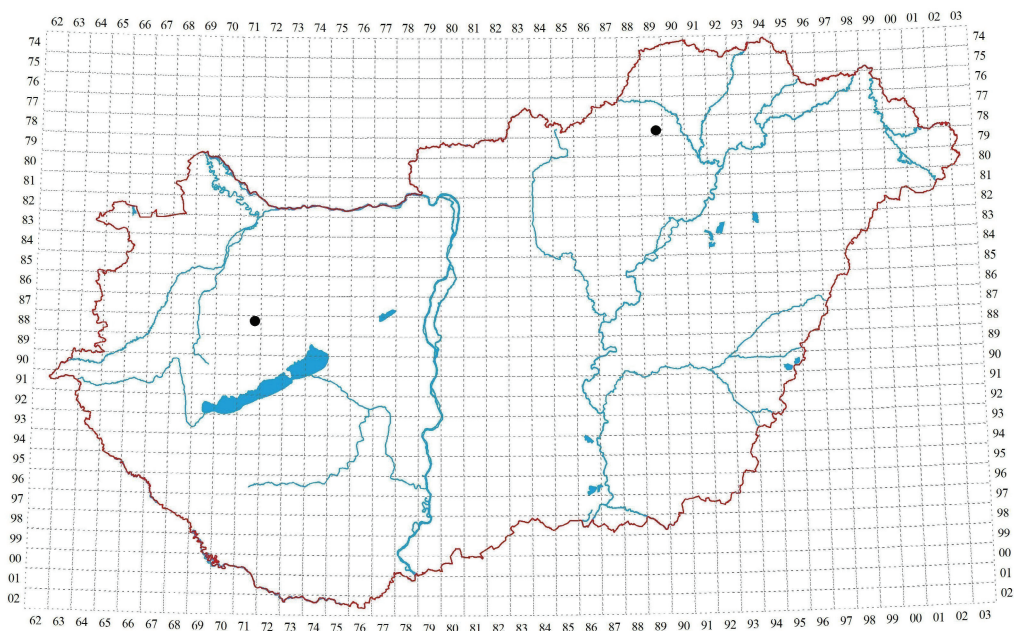


Fig. 6. Occurrences of *Vezdaea cobria* in Hungary.

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Acknowledgements – I would like to thank András Schmotzer for sharing his field experience and suggesting the locality in the Bükk Mts for a detailed study.

Összefoglaló: A *Vezdaea cobria* egy rendkívül kis termetű, efemer karakterű, jellemzően élő vagy elhalt lombosmohák és leveles májmohák gametofitonján növe zuzmófaj. A faj Magyarország területéről eddig nem volt ismert, előfordulását csak néhány európai országból (Ausztria, Egyesült Királyság, Csehország, Németország, Franciaország), valamint az USA északnyugati területéről, Alaszkából jelezték. Bakonyi és bükkii élőhelyén egyaránt meredek, kisavanyodott talajfelszínről rézsűn él.

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(submitted: 22.05.2023; accepted: 16.06.2023)

