

Bryocentria hypothallina (Hypocreales) – a new species on *Metzgeria furcata*

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Summary: *Bryocentria hypothallina* (Bionectriaceae, Hypocreales) is described as a new species. It grows necrotrophically on the liverwort *Metzgeria furcata* (Metzgeriales), causing bleached, insular infections. Ascospores are formed on the ventral side of the thalli and perforate them from below. The novel ascomycete species is recorded from France, Norway, and Spain. Thus, the obligately bryophilous genus *Bryocentria* now includes eight species. Our new species is characterized ecologically by its specialized microhabitat, and morphologically by having ascospores bearing tiny cyanophilous warts.

Keywords: Bryophily, hepaticolous ascomycetes, liverworts as hosts, necrotrophic parasites, thallus perforation.

Introduction

During fieldwork in temperate forests in Norway, France and Spain, bleached, necrotic patches of the liverwort *Metzgeria furcata* were detected on trunks of deciduous trees. Closer examination revealed the presence of a necrotrophic ascomycete that is presented below as a new species.

Material and methods

The specimens were studied using standard methods. Measurements and illustrations of ascospores were done in tap water, those of excipular cells, asci, ascospores (n=40), and hyphae in lactophenol cotton blue.

Taxonomy

Bryocentria hypothallina B. Nordén, Gardiennet, Priou & Döbbeler, *sp. nov.* (Bionectriaceae, Hypocreales) Figs 1–2
Mycobank MB812619

Diagnosis: *Perithecia thallos hospitis perforantia, globosa, aurantiaca usque ad flava*, 160–220 μm diam. *Excipulum cellulis rectangularibus vel rotundatis*, 5–11 μm largis, *parietibus cyanophilis formatum*. *Asci cylindrici vel in parte media vel basali leviter dilatati*, 36–50 \times 5–6.5 μm , *octospori*. *Ascospores incololatae, anguste ellipsoidales, bicellulares*, 8–10 \times 2.5–3.5 μm , *verruculis cyanophilis ornatae*. *Habitat parasitica in hepaticis corticalibus speciei Metzgeria furcata laesiones albidas in hospite efficiens*.

Type: Norway. Rogaland, Strand, Rag, broadleaved forest, on bark of old *Fraxinus excelsior*, 59°06'07"N, 05°57'49"E, alt. 90 m, 4 Oct 2012, B. Nordén & J.B. Jordal A12-4214 (holotype, O).

Etymology: *hypo* (gr.) = below, *thallinus* (gr./lat.) = adjective pertaining to the thallus, the whole referring to the position of the ascospores.

Description: **Ascospores** perithecial, perforating the thallus from the ventral side, orange to yellowish, globose, (140–)160–220 μm diam., sometimes with a few short, colourless, blunt, up to 3.5 μm wide setae positioned apically; apical part of the ascospore disk-like when seen from above, 50–75 μm diam., delimited by unaltered host cells, with an inconspicuous, pore-like ostiole in the centre; os-

tiolar canal lined with delicate periphyses. **Excipulum** seen from the outside in the middle and lower part of the ascospores with more or less isodiametric, angular or somewhat rounded cells, 5–11 (–13) μm wide, with cyanophilous walls, the cells becoming smaller and more rounded towards the apex; surface of excipulum with some adjacent hyphae, 1.5–2 μm wide, partly connected to the thallus; wall of excipulum in optical section about 8–12 μm thick; no reaction in KOH; outer and inner excipular wall cells with cyanophilous reaction. **Apical paraphyses** present, extremely delicate and rapidly dissolving. **Asci** unitunicate, thin-walled, cylindrical or slightly enlarged in the middle or upper part, (33–)36–50 (–55) \times 5–6.5 (–7) μm , sometimes an apical ring visible, 8-spored, numerous. **Ascospores** colourless, narrowly ellipsoidal, one-septate, one half usually slightly wider, (7.5–)8–10 \times 2.5–3.5 μm , epispore with small, cyanophilous warts, cyanophilous band absent, most spores arranged biserially in the asci; living ascospores with a few yellowish droplets of varying sizes. **Hyphae** close to ascospores white and arachnoid, farther from ascospores inconspicuous, colourless, 1–1.5 (–2) μm wide, growing superficially over the thallus and within the cells. **Asexual state** not observed.

Host: *Metzgeria furcata* (L.) Dumort., one of the most frequent liverworts of Europe and many other parts of the world (PATON, 1999; DAMSHOLT, 2002).

Known distribution: France, Norway, Spain.

Additional specimens examined: FRANCE. Dept. Morbihan, La Gacilly, les Fougerets, Cournon, Chemin du Bois Bis, 47°55'7.52"N, 02°08'07"W, alt. 8 m, 14 Apr 2015, J.-P. Priou 15087 (Herb. Priou). La Gacilly, les Bresles, 47°45'54.34"N, 02°08'23.77"W, alt. 19 m, 13 Apr 2015, J.-P. Priou 15082 (Herb. Priou). La Gacilly, D8 La Villio, 47°46'42.73"N, 02°09'48.14"W, alt. 38 m, 19 Apr 2015, J.-P. Priou 15089 (O). Les Fougerets, La Ville Basse, 47°45'3.78"N, 02°12'35.25"W, alt. 53 m, 13 Apr 2015, J.-P. Priou 15083 (Herb. Priou); 17 Apr 2015, J.-P. Priou 15086 (Herb. Priou). Dept. Vendée, Dorby, Pont de Diet, 46°32'15"N, 00°45'32"W, alt. 67 m, 12 May 2009, P. Ribollet (M). Dept. Côte-d'Or, Vernot, Combe Milvy, 47°28'52"N, 04°59'05"E, alt. 489 m, 19 Dec 2011, A. Gardiennet 11019 (Herb. Gardiennet). NORWAY. Rogaland, Suldal, Ørland, broadleaved forest, on bark of old *Ulmus glabra*, 59°32'50"N, 06°22'20"E, alt. 40 m, 5 Oct 2012, B. Nordén & J.B. Jordal A12-4331 (M); Suldal, Ørland, broadleaved forest, on bark of old *Ulmus glabra*, 59°32'51"N, 06°22'19"E, alt. 70 m, 5 Oct 2012, B. Nordén & J.B. Jordal A12-4344 (O). SPAIN. Pais Vasco, Oiartzun, Er-

goien, 43°17'20.75"N, 01°50'21.81"W, alt. 56 m, 18 May 2015, J.-P. Priou 15120 (Herb. Priou).

Remarks: The infected host plants die off, lose their light green colour and become bleached. Several liverwort thallus layers may be interconnected by hyphae. Ascumata form at both sides of the midrib on the ventral thallus side. Perforation of the one-celled thick thallus occurs rather late in the fungus' development, once the ascumata reach about 80 µm in diameter. Hyphae at the apical part of the ascumata can grow between adjacent cells and disrupt them. The irregularly delimited hyphal tissue expands by causing the disintegration of host cells. A flat disk results, forming the ascumatal apex. Mature ascumata covered by dead, but structurally unaltered host cells usually protrude slightly above the thallus level.

In herbarium material the vivid colour of the fruit-bodies soon begins to disappear. Several-month-old ascumata may be completely colourless and therefore hard to distinguish from the substrate.

Bryocentria hypothallina exhibits the key characters of *Bryocentria* including the definitive excipular structure, its habit of forming numerous thin-walled asci, and having one-septate ascospores with cyanophilous structures (DÖBBELER, 2004, 2010). Apart from *B. bronngniartii*, the type of the genus, all congeneric species are necrotrophic parasites. The hepaticolous *B. bronngniartii* on *Frullania dilatata* and *B. merospora* on epiphyllous *Lejeuneaceae* both perforate the leaves of their hosts. *Bryocentria metzgeriae* is another obligate leaf or thallus perforator infecting corticolous liverworts, including *Metzgeria furcata*. It differs from *B. hypothallina* by having smaller (up to 7.5 µm long), fusiform ascospores with a central cyanophilous band.

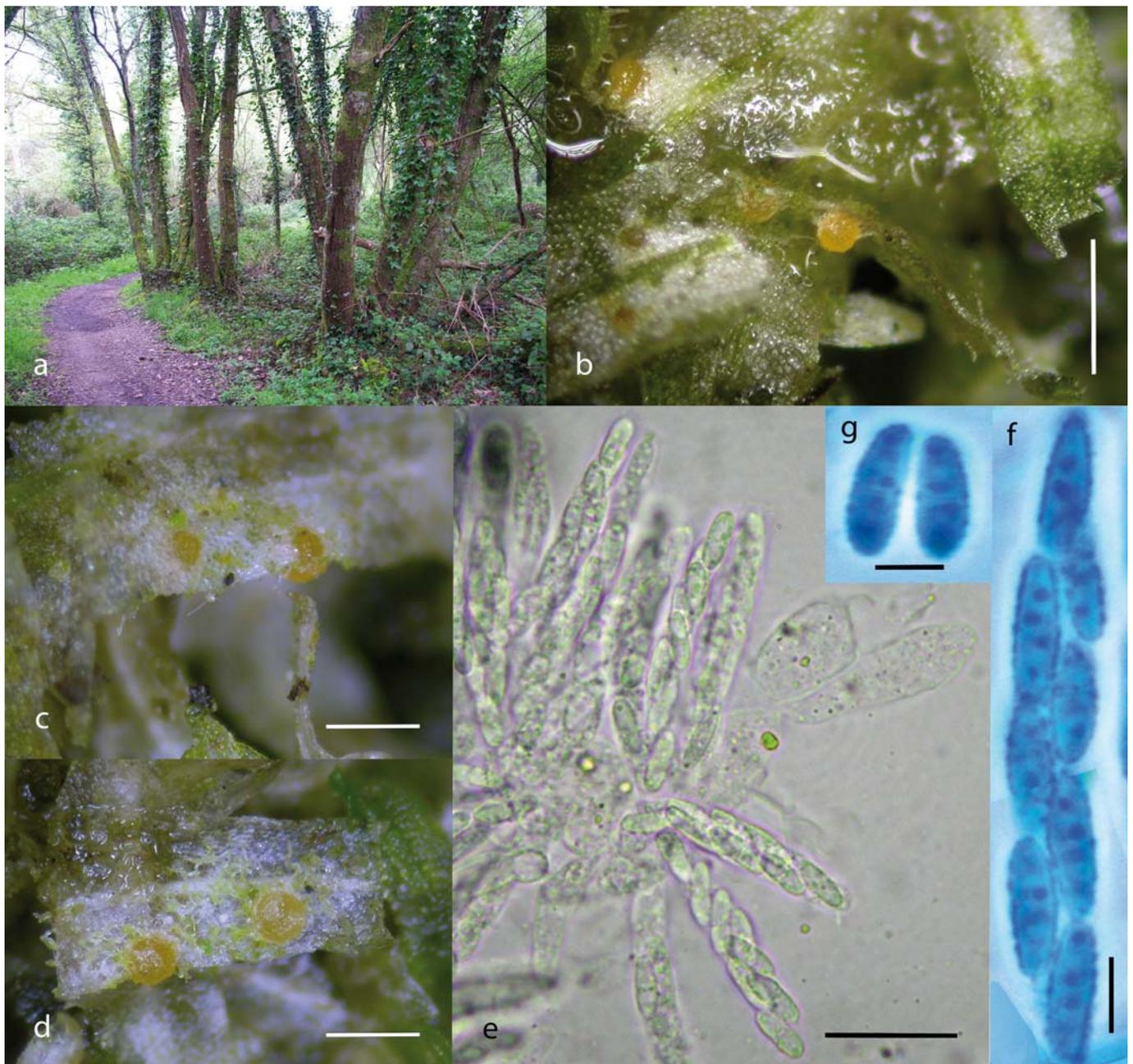


Fig. 1. — *Bryocentria hypothallina* on epiphytic *Metzgeria furcata*. a. Habitat, La Gacilly, les Bresles, France. b. Whitish, dead thalli of *M. furcata* with several orange-coloured ascumata in different developmental stages, three in dorsal, two in side view. c. Ascumata in side view. d. Ascumata, ventral view. e. Mature asci in water. f. Ascus in cotton blue. g. Two ascospores in cotton blue showing cyanophilous warts. a, b, c, d, e: J.-P. Priou 15082. f, g: Nordén & Jordal A12-4214 (holotype). Scale bars: b: 1 mm, c-d: 400 µm, e: 20 µm, f-g: 5 µm. Photos: a, b, c, d, e: Priou; f, g: Nordén.

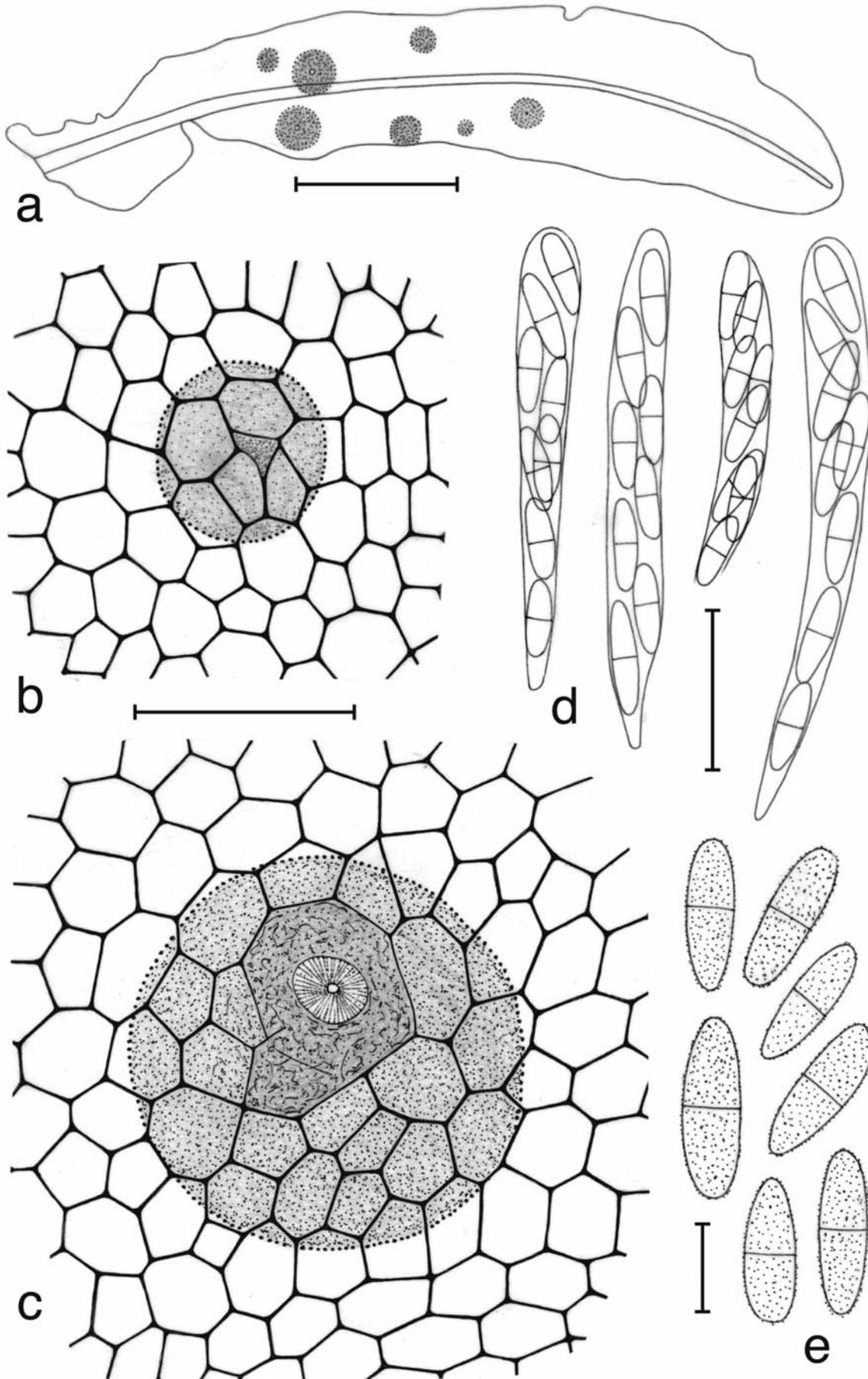


Fig. 2. — a. Thallus of *Metzgeria furcata* with several *Bryocentria hypothallina* ascomata in different developmental stages, dorsal view. Scale bar: 600 μm . b. Young ascoma showing initial, intercellular thallus perforation, dorsal view. c. Mature ascoma with apical disc and central ostiole between disrupted and dissolved host cells, dorsal view. Scale bar b, c: 100 μm . d. Asci. Scale bar: 15 μm . e. Ascospores. Scale bar: 5 μm . a, b, c: Nordén & Jordal A12-4331, d, e: Nordén & Jordal A12-4214 (holotype).

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