

SHORT COMMUNICATION

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Freshwater ascomycetes: *Jahnula apiospora* (Jahnulales, Dothideomycetes), a new species from Prince Edward Island, Canada

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Abstract A new ascomycete species, *Jahnula apiospora* (Jahnulales, Dothideomycetes), collected from submerged wood in a freshwater creek on Prince Edward Island, Canada, is described and illustrated. The characteristic features of the new species are globose to subglobose, black, ostiolate, membranous ascomata with broad, brown, subtending hyphae; a peridial wall composed of an outer layer of thick-walled cells occluded by black, amorphous material along the upper two-thirds of the ascoma; trabeculate pseudoparaphyses; cylindrical to narrowly fusoid, fissitunicate asci; and brown, one-septate, apiosporous ascospores without a gelatinous sheath or appendages.

Key words Aquatic fungi · Loculoascomycetes · Lotic · Submerged wood · Systematics

Jahnula Kirschst. is the largest genus in the order Jahnulales (Dothideomycetes) (Pang et al. 2002; Campbell et al. 2007) and, at present, contains 13 species (Hawksworth 1984; Hyde 1992; Hyde and Wong 1999; Pang et al. 2002; Pinruan et al. 2002; Raja and Shearer 2006). In this article, we describe and illustrate a new species of *Jahnula* that was found on submerged wood collected from a freshwater creek on Prince Edward Island, Canada.

Methods for collection, characterization, and illustration of the new fungus are described in Fallah and Shearer (2001), Shearer et al. (2004), and Raja and Shearer (2006). Latitude and longitude were recorded in the field and are

presented in the specimen citation section. For ascospore septum position, the decimal system described by Shoemaker and Babcock (1989) was used.

Jahnula apiospora A. Carter, Raja & Shearer, sp. nov.

Figs. 1–9

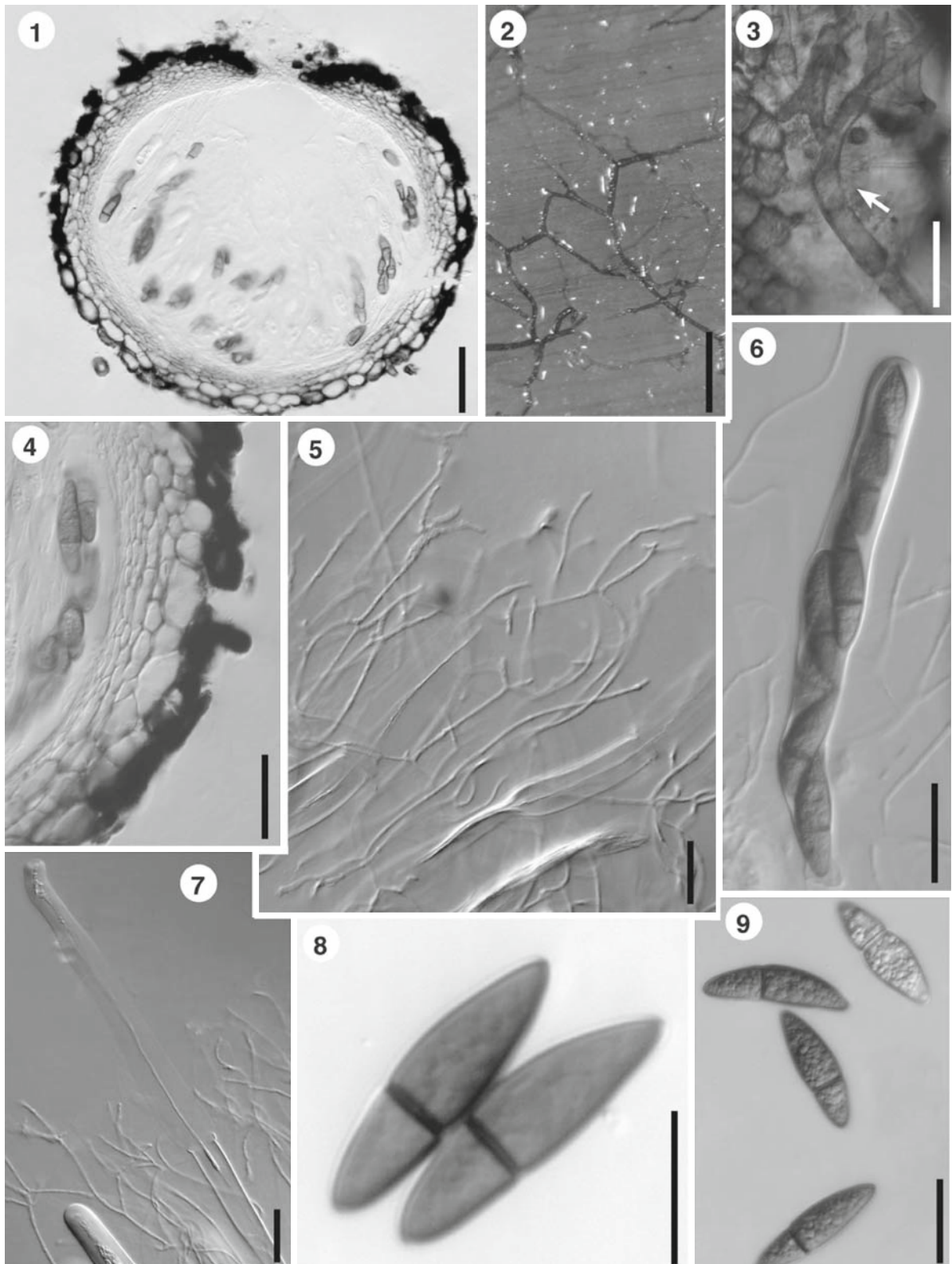
Ascomata dispersa, superficialia vel immersa, globosa vel subglobosa, membranacea, per hyphas latas, brunneas, superficialia, stoloniformes, substratum connexa 250–305 × 300–360 µm, latas nigerrima, ostiolata. Ostiola circularia, depressa. Peridium 40–45 µm crassum, transverse ex cellulis 6–10 cellulae compositum. Pseudoparaphyses trabeculatae, in matrice gelatinosa inclusae. Asci 108–140 × 14–22 µm, fissitunicati, cylindrici, octospori. Ascosporae 30–40 × 8–12 µm, uniseriatis vel biseriatis, fusiformes, basi uniseptatae, apiosporicae, brunneae, multiguttulatae.

Ascomata scattered, superficial to partially immersed in wood, attached to the wood by broad, brown, superficial, stoloniferous hyphae, membranous, globose to subglobose, 250–305 × 300–360 µm, black, ostiolate; ostiole circular, depressed (Figs. 1–3). Peridium 40–45 µm wide, composed of *textura angularis* in surface view; in longitudinal section 6–10 cell layers wide, composed of an outer layer of thick-walled cells 30–33 × 15–19 µm, occluded by black, amorphous material along the upper two-thirds of the ascomata; inner layer of moderately thick-walled, large, brown, isodiametric to angular cells, 12–26 × 5–10 µm wide (Fig. 4). Pseudoparaphyses hyaline, trabeculate, narrow, branched, and anastomosing above the asci, embedded in a gelatinous matrix (Fig. 5). Asci 108–140 × 14–22 µm (mean = 122 × 18 µm, $n = 20$), basal, cylindrical to narrowly fusoid, pedicellate (Fig. 6), bitunicate, fissitunicate (Fig. 7), with or without an apical chamber; endoascus about 18 µm wide, extending to 160–190 µm in length, with eight, overlapping uniseriate to biseriate ascospores. Ascospores 30–40 × 8–12 µm (mean = 35 × 8 µm, $n = 40$), 7–9 µm wide at the septum, fusiform, slightly constricted at the septum, apiculate, unequally one-septate; septum submedian (0.44–0.64; mean = 0.55, $n = 40$), apical cell 18–27 µm long, basal cell shorter than apical cell, 11–16 µm long, slightly curved, hyaline when young, brown

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Figs. 1–9. *Jahnula apiospora* from the holotype. **1** Longitudinal section through ascoma. **2** Broad, thick-walled, brown hyphae on wood. **3** Squash mount of ascoma; arrow indicates broad, thick-walled subtending hypha. **4** Peridium. **5** Trabeculate pseudoparaphyses. **6** Ascus. **7** Fissitunicate ascus dehiscent. **8, 9** Ascospores; note the darkened septum in **8**. Bars **1, 3, 4–9** 20 μ m; **2** 1 mm

at maturity, multiguttulate, smooth-walled, lacking a gelatinous sheath and appendages (Figs. 8, 9).

Single-spore isolates grown on corn meal agar (CMA; Difco) slow growing, reaching about 1–2 mm diameter in 30–40 days, black, effuse; hyphae broad, thick-walled, and constricted at the septa; no anamorph observed.

Etymology: From the Greek *ápion* = pear; *sporá* = spore, referring to the pear-shaped two-celled ascospores, with one cell markedly smaller than the other.

Materials examined: CANADA. Prince Edward Island, 46°12'38" N, 63°19'40" W, on submerged decorticated wood, in a small creek beside dirt road near Bonshaw and Trans Canada Highway, 13 October 2007, Adrian Carter, AC-706 (holotype: ILL40554). Ex-holotype culture DAOM 239555 is deposited at the Canadian Collection of Fungi Cultures in Ottawa, Ontario.

Known distribution: Canada (Prince Edward Island).

Jahnula apiospora agrees well with the generic characteristics of *Jahnula* and is most similar to the type species, *J. aquatica* (Plöttner & Kirschst.) Kirschst. (Hawksworth 1984; Hyde and Wong 1999; Raja and Shearer 2006). Similarities between the two taxa include the presence of wide, brown hyphae attached to the ascomata, a peridium of large, polyhedral cells with large cell lumens, trabeculate pseudoparaphyses, cylindrical fissitunicate asci arising from the base of the ascoma, and brown, 1-septate, multiguttulate ascospores lacking a gelatinous sheath.

The two species differ in the shape of the ascomata, which is globose with a recessed ostiole in *J. apiospora*, and globose to broadly obpyriform and papillate in *J. aquatica*. A distinctive feature of *J. apiospora* not present in *J. aquatica* is the presence of a layer of black amorphous material on the upper two-thirds of the ascomata (Figs. 1, 2). The ascospores of *J. apiospora* are narrower (8–12 µm wide) than those of *J. aquatica* (11–16 µm wide), and those of *J. apiospora* have a longer apical than basal cell, while the ascospore cells of *J. aquatica* are approximately equal in length or the basal cell may be slightly longer than the apical cell. The ascospore midseptum of *J. apiospora* is more prominently darkened (Fig. 8) than that of *J. aquatica*.

A recent molecular phylogenetic study of the Jahnulales inferred from 18S and 28S ribosomal DNA sequences (Campbell et al. 2007) revealed that *Jahnula* was polyphyletic. *Jahnula granulosa* K.D. Hyde & S.W. Wong and *J. rostrata* Raja & Shearer were sister taxa to *J. aquatica* in the *Jahnula* s. str. clade, whereas the remaining species of *Jahnula* occurred in another clade. *Jahnula apiospora* differs from *J. granulosa* in having a recessed ostiole as opposed to a papillate ascoma, trabeculate versus septate pseudoparaphyses, and black amorphous material present on the surface of the ascomata. In addition, the ascospores of *J.*

apiospora are fusiform, apiosporous, smooth-walled, and lack a gelatinous sheath, whereas those of *J. granulosa* are ellipsoidal to broadly fusiform, medially septate, granulose as viewed by scanning electron microscopy (SEM), and have a gelatinous sheath (Hyde and Wong 1999). The third member of the *Jahnula* s. str. clade, *J. rostrata*, differs from *J. apiospora* in having a prominent ascomal neck, septate rather than trabeculate pseudoparaphyses, and ellipsoidal to broadly ellipsoidal ascospores. In addition, the ascospore septum of *J. rostrata* is medial, the ascospore walls are roughened in a striate pattern, and an ascospore sheath is present (Raja and Shearer 2006).

Jahnula apiospora differs morphologically from all the taxa in the second clade of *Jahnula* species, which itself appears to be polyphyletic (Campbell et al. 2007). Molecular sequence data are necessary to determine the phylogenetic placement of *J. apiospora* within the Jahnulales and to resolve relationships within the genus *Jahnula*.

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