Two new species of *Hypoxylon* from China*

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Hypoxylon hubeiense and *Hypoxylon yunnanense* (Xylariales, Xylariaceae) are described as new species from China. Morphological descriptions and photographs of stromata and microstructures are provided based on the Chinese material, and the delimitation of these species from similar taxa **is** discussed.

Keywords: Ascomycota, pyrenomycetous fungi, taxonomy.

Hypoxylon Bull. is a large and cosmopolitan genus, which has its highest diversity in the tropics and subtropics (Martín 1968 a, b; Ju & Tzean 1985; Van der Gucht et al. 1997; Romero & Hladki 2009). The genus *Hypoxylon* has been studied by many mycologists (Miller 1928, 1932; Martín 1967, 1968 a, b; Whalley 1977, 1993; Rogers & Candoussau 1980, 1982; Rogers 1985; Rogers & Samuels 1985; Granmo 1999) and two world monographs were published (Miller 1961; Ju & Rogers 1996). The genus is still poorly known in China, although Tai (1979) listed 35 species most of which (33) were previously reported by Teng (1963). Later, Abe & Liu (1995) found eight species of *Hypoxylon* in Zhejiang province, but the species diversity of *Hypoxylon* in China needs further investigations. This paper reports two new species of *Hypoxylon*, namely, *H. hubeiense* and *H. yunnanense*. Illustrations and descriptions of these species are provided.

Materials and methods

The studied specimens are deposited at the Herbarium of Mycology of Jilin Agricultural University (HMJAU). Microscopic features and measurements were made from slide preparations mounted in water, 10 % KOH and Melzer's iodine reagent. The photographs of asci, ascal apical ring, and ascospores were taken by using a VHX-600E microscope of the Keyence Cor-

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poration. The photographs of stromatal surface were taken with a ZSA30w microscope and S70 Canon camera. External stromatal colors were recorded and coded after Rayner (1970). The methods of collecting, preservation, and identification of the examined specimens follow those of Ju and Rogers (1996).

Taxonomy

Hypoxylon hubeiense Hai-Xia Ma, Lar. N. Vassiljeva & Yu Li, sp. nov. – Fig. 1. MycoBank no.: MB 563692

A *Hypoxylo rickii* in perisporio sine ornamentis spiralibus inconspicuis, in ascosporis rima germinativa stricta praeditis et in peritheciis globosis vel obovoideis differt.

Holotypus. – CHINA, Hubei Province, Suizhou City, on the bark of fallen branch, 21 Nov 2009, *leg*. Haixia Ma, HMJAU 20819.

Stromata pulvinate to effused-pulvinate, with inconspicuous or slightly conspicuos perithecial mounds, 0.3–1.5 cm long × 0.2–0.8 cm wide × 0.5–1.5 mm thick; surface brick (59); orange granules immediately beneath surface and between perithecia, with KOH-extractable pigments orange (7); the tissue below the perithecial layer black brown, inconspicuous to 0.9 mm thick. Perithecia spherical to ovoid, 0.4–0.5 mm in diam. × 0.5–0.6 mm high. Ostioles lower than the stromatal surface. Asci 41–48 × 4.5–6 µm in the spore-bearing portions, the stipes 40–70 µm long, with apical ring lightly bluing in Melzer's iodine reagent, discoid, 0.5–0.8 µm high × 1.2–1.8 µm wide. Ascospores brown, unicellular, ellipsoid, most inequilateral, infrequently equilateral, with broadly rounded ends, 6.5–8.5 × 4–5 µm, with straight germ slit slightly less than to nearly spore-length; perispore dehiscent in 10 % KOH.

Etymology. – Refers to the type locality Hubei.

Habitat. – The fungus grows on the bark of fallen branches in mixed evergreen and deciduous broadleaf forests at about 600 m altitude in a subtropical monsoon climate.

Distribution. – Known only from the type locality.

Remarks. – According to the key by Ju & Rogers (199&9, *Hypoxylon hubeiense* belongs to group D and subgroup 1. It is very similar to *Hypoxylon rickii* M. Ju & J. D. Rogers in stromatal morphology and color, but the latter has an inconspicuous coil-like ornamentation on the perispore. In addition, *H. rickii* has a slightly sigmoid germ slit in spore-length, whereas *H. hubeiense* has a straight germ slit slightly less than to nearly spore-length. Furthermore, *H. hubeiense* could be separated from *H. rickii* by the perithecial shape (spherical to ovoid versus tubular). It differs from *H. subgilvum* var. *microsporum* (Y. Abe) Y.M. Ju & J.D. Rogers by larger ascospores and larger perithecia.

Hypoxylon yunnanense Hai-Xia Ma, Lar. N. Vassiljeva & Yu Li, **sp. nov.** – Fig. 2. MycoBank no.: MB 564008

A *Hypoxylo dieckmannii* in ascosporis (9,5)10,5–11,5(12,5) × 4,5–6 µm differt; a *Hypoxylo hughesii* in superficie stromatica albomaculata et in peritheciis obovoideis 0,1–0,3 × 0,2–0,4 mm differt.

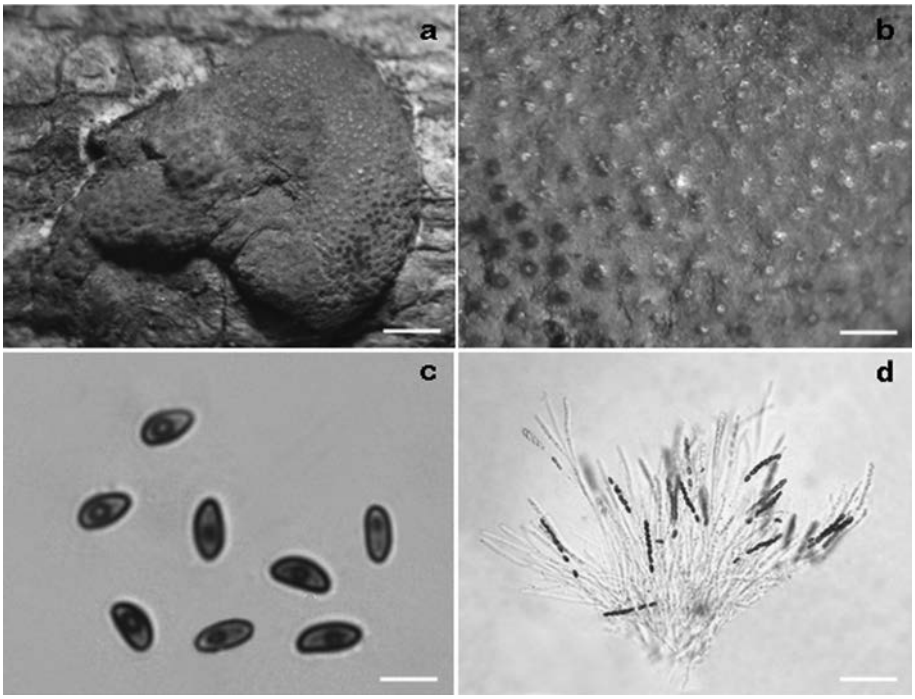

Fig.1. – *Hypoxylon hubeiense*, holotype. **a.** Stroma, bar 2.5 mm. **b.** Stromatal surface, bar 0.8 mm. **c.** Ascospores, bar: 6 µm. **d.** Asci, bar: 42 µm.

Holotypus. – CHINA, Yunnan Province, Yeya Lake, on the bark of a fallen branch, 1 Sep 2010, leg. Haixia Ma, HMJAU 22605.

Stromata effused-pulvinate, with inconspicuous perithecial mounds, 0.5–2.5 cm long × 0.4–1.5 cm wide × 0.5–1 mm thick; surface brown vinaceous (84), dark brown granules immediately beneath surface and between perithecia, without apparent KOH-extractable pigments; the tissue below the perithecial layer black, inconspicuous to up to 0.6 µm. Perithecia obovoid, 0.1–0.3 mm in diam. × 0.2–0.4 mm high. Ostioles lower than the stromatal surface. Asci 130–150 µm total length × 6–7.5 µm wide, the spore-bearing parts 68–80 µm long, with apical ring bluing in Melzer's iodine reagent, discoid, 0.5–0.8 µm high × 1.2–1.4 µm wide. Ascospores light brown to brown, unicellular, ellipsoid-equilateral, with usually narrowly rounded ends, often almost acute, (9.5)10.5–11.5(12.5) × 4.5–6 µm, with straight germ slit slightly less than spore-length; perispore indehiscent, or very infrequently dehiscent, in 10 % KOH.

Etymology. – Refers to the type locality Yunnan.

Habitat. – The fungus grows on the bark of fallen branches in mixed evergreen and deciduous broadleaf forests at about 2100 m altitude in a subtropical climate.

Distribution. – Known only from the type locality.

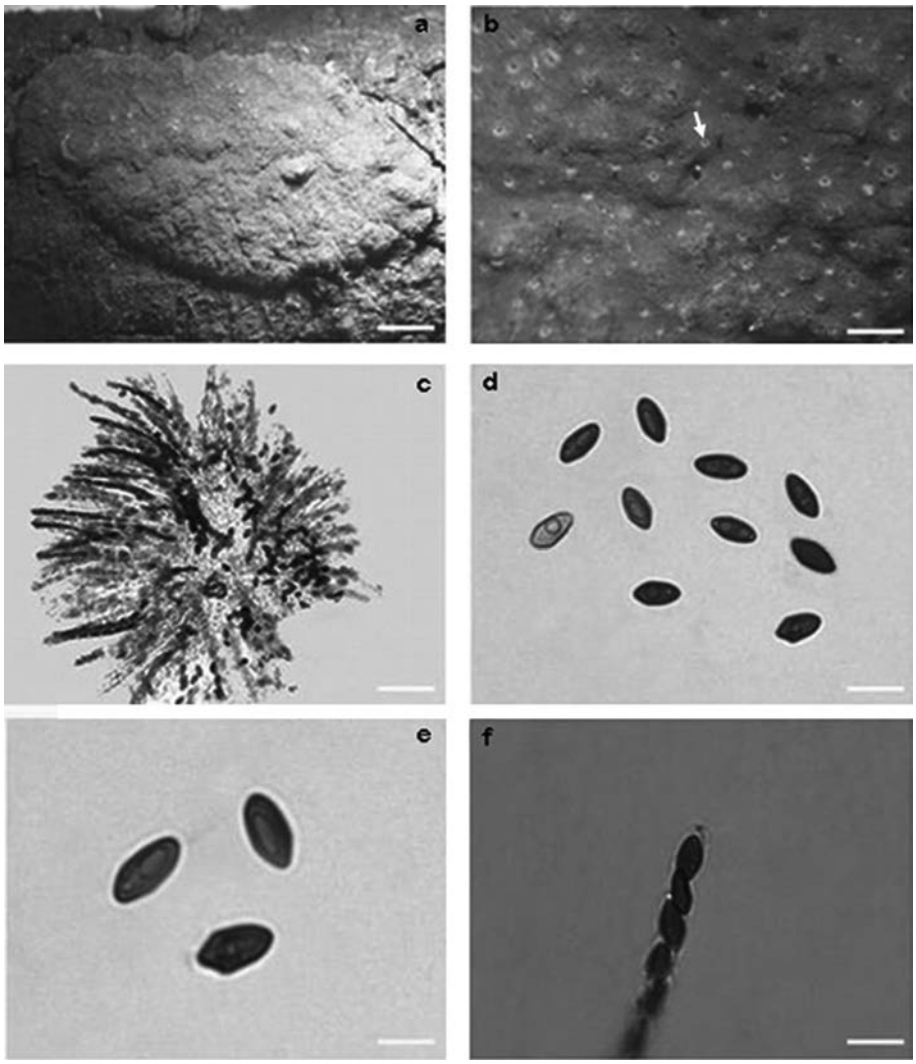

Fig. 2. – *Hypoxylon yunnanense,* holotype. **a.** Stroma, bar: 3 mm. **b.** Stromatal surface, bar: 0.8 mm. **c.** Asci, bar: 48 µm. **d.** Ascospores, bar: 13 µm. **e.** Germ slit, bar: 6.5 µm. **f.** Ascal apical ring, bar. 13.5 µm.

Remarks. – *Hypoxylon yunnanense* is somewhat similar to *H. dieckmannii* Theiss in stromatal morphology. Miller (1961) indicated rather small ascospores for *H. dieckmannii* (6–8 × 3–3.8 µm) and considered it as a small-spored variety of *H. rubiginosum* (ascospores 9–12 × 4–6 µm), but Martín (1969), Van der Gucht & Whalley (1992) and Ju & Rogers (1996) considered the two species to be distinctly different in ascospore morphology and KOH-extractable pigments of stromata. Ju & Rogers's (1996) indicated the wider range of ascospore size, 6.5–10(11) × 3.5–4 µm, for *H. dieckmannii*, but the

Chinese specimen has even larger ascospores, (9.5)10.5–11.5(12,5) × 4.5–6 µm, on average.

Hypoxylon hughesii Y.-M. Ju & J. D. Rogers (Ju & Rogers 1996) has similar ascospore morphology and stromatal color, but it can be separated from *H. yunnanense* by the surface of the stromata, which has white spots in *H. yunnanense* (Fig. 2 b). In addition, there are differences in the perithecial shape and size. The perithecia of *H. hughesii* are spherical 0.1–0.2 mm in diam., whereas those in *H. yunnanense* are obovoid 0.1–0.3 × 0.2-0.4 mm. Furthermore, the apical ring of *H. hughesii* is larger (1–1.5 µm high × 2.5–3 µm wide).

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