Coccomyces hubeiensis, a new fungus of Rhytismatales from China

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Abstract — A new fungus found on fallen leaves of Rhododendron erubescens from the Shennongjia forestry region of Hubei Province, China, is described as Coccomyces hubeiensis. This species differs from C. dentatus by its asci with subtruncate-conical apices, paraphyses branched near the top, infrequent zone lines, and the absence of conidiomata. The type specimen is deposited in the Reference Collection of Forest Fungi of Anhui Agricultural University, China (AAUF).

Key words — Rhytismataceae, morphology, Ericaceae

Introduction

Coccomyces De Not., established by de Notaris in 1847, is now placed in the Rhytismatales (Leotiomycetes, Ascomycota) (Kirk et al. 2008). Coccomyces taxa are characterized by polygonal or more or less circular ascomata that open by several radiate or irregular splits, cylindrical to clavate asci, and filiform, long-fusiform, or clavate ascospores, often with gelatinous sheaths (Sherwood 1980; Cannon & Minter 1986; Johnston 1986, 2000; Spooner 1990; Lin et al. 1994; Jia et al. 2012). External shape, size, and ascomal openings, ascal shape and size, and the shape of paraphyses at the apex are regarded as the most important taxonomic characters (Johnston 1986; Lin 1998).

Twenty-five Coccomyces species have been reported in China (Korf & Zhuang 1985; Lin 1998; Hou et al. 2006, 2007; Jia et al. 2012; Zheng et al. 2012) since Teng (1934) first recorded C. dentatus on Quercus and Castanea and C. delta on Lauraceae. Recently, a new Coccomyces species was found on fallen leaves of Rhododendron erubescens in the Shennongjia forestry region, Hubei Province.

Materials & methods

Mature ascomata with macroscopic characteristics of Rhytismataceae were selected from the collected specimens. We observed external shape, size, color, the opening
mechanisms of ascomata, and zone line characteristics using a stereoscope with 10–50× magnification.

The fruitbodies were rehydrated in water for 10 min, and 10–15 μm thick sections of the ascomata were cut using a freezing microtome. Microscopic examinations were mounted in water, 5% KOH, Melzer’s reagent, or 0.1% (w/v) cotton blue in lactic acid. For observing the outlines of ascomata in vertical section, sections were mounted in lactic acid or cotton blue with pretreatment in water. The gelatinous matrix surrounding ascospores and paraphyses was observed in water or cotton blue in lactic acid. The color of internal structures was observed in water. Measurements and drawings of asci, ascospores, and paraphyses were made using material mounted in 5% KOH or Melzer’s reagent and from 30 ascospores, asci, and paraphyses for each specimen. Illustrations of external shapes and internal structures of the ascomata were prepared using the Panasoianic XSJ-2 microscope drawing device.

Taxonomy

*Coccomyces hubeiensis* Y.R. Lin & M.S. Yang, sp. nov.  
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Differs from *Coccomyces dentatus* by its branched paraphyses and asci with subtruncate-conical apices and from *C. cyclobalanopsis* by its lack of excipulum and periphysoids.

**Type:** China, Hubei, Shennongjia forestry region, Xiaolongtan, alt. 1300m, on fallen leaves of *Rhododendron erubescens* Hutch. (Ericaceae), 9 July 2010, Y.R. Lin, J.L. Chen & Q. Zheng 2385 (AAUF 68493).

**Etymology:** *hubeiensis*, referring to the province where the specimen was collected.

**Zone lines** black-brown, infrequent, surrounding the bleached spots.

**Conidiomata** not observed.

**Ascomata** on both sides of the fallen leaves, but predominantly on the upper side, sparsely scattered in light grey-white, subcircular or irregular bleached areas 15–25 mm diam. without obvious edges. In surface view, ascomata triangular to pentagonal, 570–950 μm diam., shining black, moderately raising above the surface of leaf but flat or slightly hollow in the centre portion, with an obvious preformed dehiscence mechanism, opening by 3–5 radial splits which extend nearly to the edge of ascoma to expose the light yellow-brown hymenium. Lips absent. In median vertical section, ascomata intraepidermal. **Covering stroma** 30–35 μm thick near the opening, composed of black-brown textura epidermoidea or angularis with thick-walled cells 4–7 μm diam., aliform cells mainly existing near the inner layer of the covering stroma, becoming thinner towards the edge gradually and extending to the basal stroma. **Excipulum** absent. **Basal stroma** 10–18 μm thick, consisting of textura angularis with 2–3 rows of black-brown, thick-walled cells 4–6 μm diam. Colorless, thin-walled, large angular cells 6–12 μm diam. exist between the covering stroma and basal stroma. **Internal matrix stroma** poorly developed, comprised of hyaline, gelatinised textura intricata. **Subhymenium** 15–20 μm thick, composed of
colorless textura porrecta-intricata. Paraphyses filiform, 90–150 × 1.5–2 μm, septate, the tips gradually swollen to 2.5–3 μm, rarely curved or branched, and sometimes forming epithecium above the asci, enveloped in mucus 0.8–1.2 μm thick. Asci ripening sequentially, cylindric-clavate, 80–120 × 7.5–10 μm, apex subtruncate-conical, without circumapical thickening, thin-walled, somewhat long-stalked, J–, 8-spored. Ascospores arranged in a fascicle, filiform, 65–102 × 1.5–1.8 μm, hyaline, aseptate, gradually tapered to the round distal end, with a gelatinous sheath ca 1 μm thick.

Host species & distribution: producing ascomata on fallen leaves of Rhododendron erubescens; known only from the type locality, Hubei, China.

Comments—Coccomyces dentatus is closely related to C. hubeiensis in the shape of asci and in the absence of lips, periphysoids, and excipulum, but differs in ascomata that are quadrate to hexagonal, black zone lines, the presence of abundant conidiomata, and paraphyses that are apically unbranched and do not form an epithecium (Sherwood 1980). Coccomyces coronatus is distinguished from the new species by its orbicular or polygonal ascomata, short-stalked larger asci (100–130 × 11–13 μm), and shorter and wider ascospores (60–80 × 2–2.5 μm) (Sherwood 1980). Coccomyces hubeiensis resembles C. cyclobalanopsis in the shape and size of ascomata, paraphyses, and ascospores as well as in the color of the exposed hymenium. However, C. cyclobalanopsis differs in having small abundant bleached spots, a covering and basal stroma consisting of a textura globulosa, and an extremely well-developed excipulum arising from the inner layer of the covering stroma (Lin et al. 2000).

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Literature cited


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