Enumeration of Remarkable Japanese Discomycetes (6):
Notes on Two Inoperculate Discomycetes new to
Japan and One Operculate Discomycete

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Abstract Three remarkable discomycetes (two inoperculate and one operculate) are described
and illustrated: Hymenoscyphus immutabilis (Helotiaceae, Helotiales), Lachnum rachidicola
(Lachnaceae, Helotiales) and Sphaerosporella brunnea (Pyronemataceae, Pezizales). The
first two species are documented for the first time in Japan. Detailed microscopic description is provided for
Sphaerosporella brunnea for the first time for Japanese material.

Key words: Hymenoscyphus immutabilis, Lachnum rachidicola, mycobiota, Sphaerosporella
brunnea, taxonomy.

Introduction

This is the sixth part of the series on remarkable
Japanese discomycetes following Hosoya et al.
(2011) to contribute the knowledge of mycobiota in
Japan. Two inoperculate discomycetes with minute
apothecia are documented for the first time from
Japan. Microscopic examination for the confirma-
tion on identification is carried out for Sphaero-
sporella brunnea and description is provided.

Materials and Methods

Collection and observation procedures fol-
lowed Hosoya and Otani (1997) and Hosoya
(2004). Color codes followed the Pantone color
code adopting RGB system referring to a Pan-
tone color bridge (Anonymous, 2005). For previ-
ously known distribution, the database of Global
Biodiversity Information Facility (GBIF, http://
data.gbif.org/welcome.htm) was searched, and
countries with occurrence of the given species
are shown with an asterisk (*). Distributions
known only in literature are shown with double
asterisks (**). Those with both information are
shown with triple asterisks (***)

Descriptions

1. Hymenoscyphus immutabilis (Fuckel) Den-
nis, Persoonia 3: 76. 1964.

Basionym: Helotium immutabilis Fuckel, JB.
Apothecia scattered, occurring on decaying leaves, especially on the veins, short-stipitate to subsessile; disc flat to slightly convex, 0.6–1.5 mm in diameter when dry; hymenium white when fresh, still white or becoming dark yellow to pale brown (Pantone 721PC = C0 M31 Y43 K2) in drying; receptacle smooth, white; stipe concolorous with the receptacle, 0.2–0.6 mm long when dry, with smooth surface. Ectal excipulum of textura prismatica to textura globulosa, composed of subhyaline to pale-brown, thin-walled, prismatic cells of 4.0–11.0 × 3.0–7.0 μm, with slightly refractive, 7.0–11.0 μm, globulose cells mixed in the receptacle and stipe. Medullary excipulum of textura intricata, composed of hyaline, smooth, loosely interwoven hyphae of 2.0–5.0 μm wide. Ascii 67.5–77.5 × 5.0–7.0 μm, clavate, 8-spored, croziers obscure and observed only for immature asci; apex rounded, slightly thickened, pore slightly blue in Melzer’s reagent even with KOH pretreatment. Ascospores 9.0–13.0 × 3.5–4.0 (11.0 ± 1.2 × 3.9 ± 0.2, n = 20) μm, uniseriate or irregularly biseriate, fusoid to subellipsoid, non-septate, eguttulate. Paraphyses filiform, septate, hyaline, simple or branched near the base, occasionally slightly expanded at the apex of 2.0–3.0 μm wide.

T. Hosoya (culture FC-2840). All the specimens occurring on *Zelkova serrata* leaf.


Japanese name: Ochiba-shiro-byoutake

Notes. The genus *Hymenoscyphus* Gray belongs to the family Helotiaceae, order Helotiales with 155 species commonly accepted (Kirk *et al.*, 2008). The generic characteristics are: sessile to stipitate, light colored, white to yellow apothecia, ectal excipulum of textura porrecta to prismatica (rarely textura angularis to textura globulosa), medullary excipulum of textura intricata, cylindric-clavate, 8-spored, asci with rounded or conical apex; ellipsoid to fusoid or turbinate, hyaline ascospores with no septa or 1–2-septa at maturity (Dennis, 1956, 1981; Dumont, 1981; Lizoñ, 1992). Nine species have been known from Japan (Otani, 1966, 1987; Otani *et al.*, 1991; Tubaki, 1966; Katumoto, 2010).

*Hymenoscyphus immutabilis* is widely distributed in Europe, mainly occurring on fallen leaves of broad-leaved trees, such as *Alnus, Betula, Carpinus, Fagus, Populus, Quercus, Robinia, Salix* and *Ulmus* (White, 1943; Dennis, 1956; Lizoñ, 1992). *Zelkova serrata* is a new host to this species. The specimens examined in the present study shared most morphological characteristics with previous descriptions (White, 1943; Dennis, 1956; Lizoñ, 1992), except for smaller asci (cf. 80.0–105.0 × 8.0–10.0 μm in European and North American specimens) (White, 1943; Dennis, 1956; Dumont, 1981; Lizoñ, 1992) which may have been caused by the different mounting fluid. As a previous record from Japan, a specimen (CUP-JA 201, conserved in the Herbarium of Cornell University) collected from Kyoto in 1957 is known (Lizoñ, 1902). However,
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Lizoň (1992) indicated CUP-JA 201 had ellipsoid to ovoid, small sized ascospores (7.2–8.4 × 4.0 μm). CUP-JA 201 also seems to be different from the specimens examined for the present study, and may represent other taxa close to H. immutabilis. So the present paper is the first documentation of H. immutabilis in Japan.

The distinguishing characteristics of H. immutabilis are the fusoid to ellipsoid ascospores and the globose cells mixed in the receptacle and stipe section. The most closely related species is Hymenoscyphus epiphyllus (Pers.) Rehm ex Kauffman (White, 1943; Dumont, 1981). Both species can be found on fallen leaves of broad-leaved trees and share common hosts, and both with the globose cells mixed in ectal excipulum (White, 1943; Dennis, 1956; Dumont, 1981). However, the hymenium color of H. epiphyllus is bright yellow to orange both in fresh and dry, while H. immutabilis is white when fresh and becoming dark colored when dry. Hymenoscyphus epiphyllus have somewhat oblong-fusoid and larger (15.0–23.0 × 3.0–5.0 μm) ascospores.

The present fungus is classified in Helotiaceae, Helotiales.


No other synonyms.
Apothecia gregarious, cupulate to shallow-cupulate, pure white when fresh, slightly reddening if wounded, pale brown (171PC = C0 M61 Y70 K0) when dry with partially prominent reddish tint; disc 0.5–2 mm in diameter, white to pale cream-colored when fresh, yellow to reddish brown (Pantone 113PC = C0 M4 Y71 K0 to 1655PC = C0 M68 Y90 K0) when dry. Hairs cylindrical with slightly clavate apex, hyaline, 2–3(-4)-septate, thin-walled, granulate, with no crystals, 35–55×4 μm, occasionally apically swollen up to 5 μm wide. Ectal excipulum textura prismatica composed of thin-walled cells, 8–15×3–5 μm. Asci 34–38×4–5 μm, cylindrical clavate, arising from simple septa; apical pore blue in MLZ. Ascospores 6–7×1.5–2 μm, ellipsoidal to cylindrical clavate, straight to slightly curved, hyaline, asceptate, rarely containing bipolar guttules. Paraphyses narrowly lanceolate to lanceolate, exceeding the asci by 5–15 μm, up to 6 μm at the widest point.

Specimens examined. HONSHU: TNS-F-16645 (culture FC-2241), TNS-F-16647 (culture FC-2242), TNS-F-16648 (culture FC-2276), and TNS-F-16649 (culture FC-2238), Hananomaki-shi, Iwate Pref. collected on 23-V-2006. col. R. Sasagawa. TNS-F-16801 (culture FC-2333), TNS-F-16830 (culture FC-2348), TNS-F-16832 (culture FC-2343), TNS-F-35017 (culture FC-2592), and TNS-F-41104 (culture FC-2742), Tsukuba University Sugadaira Montane Research Center, Ueda-shi, Nagano Pref. collected on 7-VI-2007, 10-VI-2007, 10-VI-2007, 31-V-2010, 1-VII-2011, respectively. col. T. Hosoya. All the specimens were collected on pinnately com-
pound leaves of *Juglans mandshurica*.

Previously known distribution. Korea** (Han et al., 2009).

Japanese name: Kurumi-shirohinano-chawan-
take

Notes. *Lachum radicicola* was described recently (Han et al., 2009). It is characterized by its host, absence of crosiers and reddening apothecia. The seven sequences obtained from FC-2241, 2242, 2276, 2238, 2333, 2348, 2343, and two

![Fig. 5. *Sphaerospora brunnea* (TNS-F-46870). A. Fresh apothecia occurring on burnt ground. B. Section of an apothecium showing the ectal and medullary excipulum. C. Close up of ectal excipulum at the margin. D. Paraphyses. E. Upper portion of asci. F–G. Ascospores. Note thick wall and air bubble and oil drops contained in the ascospore. H. Ascus observed in Melzer’s reagent. Note ascal content stained brown in Melzer’s reagent. I. Hairs at the bottom of ectal excipulum. J. Hairs near the margin. Note acicular, solidified apices. Scales. A. 1 μm. B, 20 μm; C, 100 μm; D–J, 10 μm. B–G, I–J, mounted in lactic acid, H, mounted in Melzer’s reagent.](image-url)
sequences from Korea (JGH52152, and JGH52679, provided by one of the author (JGH)) shared high similarity (> 99%), and supported our identification. The specific concept seemed to be well-defined. The present fungus is classified in Lachnaceae, Helotiales.


See Rifai (1968) for synonyms.

**Apothecia** gregarious, sessile, saucer shaped or shallow cup shaped, externally pubescent to spiny due to hairs, 3–6 mm in diameter when fresh; disc concave, reddish brown (173PC = C0 M80 Y94 K1) or paler when fresh, becoming darker colored. **Hairs** at the margin or upper ectal excipulum acicular, thin walled, 2–3 celled, with pointed, frequently solidified (thick-walled) apex, 37–63 μm in length, 5–10 μm at the base; hairs on middle or lower ectal excipulum becoming longer, cylindrical with rounded apex, 62–75 μm in length, 5–7.5 μm at the base. **Ectal excipulum** textura angularis, composed of thin-walled, elongate cells of 15–30 × 2–50 μm, arranged with their long axis almost perpendicular to the surface. **Medullary excipulum** textura intricata, composed of hyphae of 5–10 μm wide.

**Asci** ca 220 × 15–20 μm, cylindrical, thin-walled, MLZ- with or without 3% KOH pretreatment, arising from crosiers; when observed in MLZ, the contents of ascii stained brown. **Ascospores** (14–)15–16.5 (15 ± 0.42 in average ± SD, n = 20) μm in diameter, globose, one-celled, moderately thick (1 μm thick) and smooth-walled, often containing a bubble when observed in lactic acid, uniseriate in the ascii. **Paraphyses** cylindrical, slender, septate, simple, filled with brownish content stained brown by MLZ, 2.5–3 μm below, up to 5 μm at the apex.


Japanese name: Yakeato-marumi-chawantake

Notes. Rifai (1968) provided a detailed line-drawings for the microscopic structure, so we do not provide line-drawings here. He also mentioned the possible anamorph (*Botrytis*-like) obtained by other researchers. However, obtaining a culture was not tried. We could not find any *Botrytis*-like structure on the substrate, either.

Although *S. brunnea* is previously known in Japan (Otani, 1989; Imazeki et al., 2011.), no description with microscopic features were provided before for Japanese material. The authors therefore confirmed its identification based on microscopic characteristics, and here provide the description for Japanese material. The present fungus is classified in Pyronemataceae, Pezizales.

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**References**


