Enumeration of Remarkable Japanese Discomycetes (11): Notes on Three Species of Lachnaceae New to Japan with One New Combination

Yukito Tochihara¹, Rei Sasagawa² and Tsuyoshi Hosoya³*

¹ Department of Biological Sciences, Graduate School of Science, The University of Tokyo, 7–3–1 Hongo, Bunkyo-ku, Tokyo 113–0033, Japan
² Faculty of Life and Environmental Science, Tsukuba University, 1–1–1 Tennodai, Tsukuba, Ibaraki 305–0005, Japan
³ Department of Botany, National Museum of Nature and Science, 4–1–1 Amakubo, Tsukuba, Ibaraki 305–0005, Japan
* E-mail: hosoya@kahaku.go.jp

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Abstract Three species of Lachnaceae new to Japan are described and illustrated with one new combination: Brunnipila clandestina, B. pseudocannabina (new combination), and Incrucipulum capitatum.

Key words: Brunnipila clandestina, Brunnipila pseudocannabina, Incrucipulum capitatum, mycobiota, taxonomy.

Introduction

This is the eleventh part of the series of remarkable Japanese discomycetes following Hosoya and Zhao (2016) to elucidate Japanese cup-fungi mycobiota. Three species of Lachnaceae Raitv. are newly documented from Japan, including one new combination. Descriptions, micrographs and line drawings of three species are provided.

Materials and Methods

Collection, isolation and observation procedures mainly followed Hosoya and Otani (1997) and Hosoya (2004). Examination of micromorphology was carried out using cotton blue dissolved in water (CB/W) or cotton blue dissolved in lactic acid (CB/LA). Color codes followed the Pantone color code adopting CYMK system referring to a Pantone color bridge (Anonymous, 2005).

For previously known distribution, the database of Global Biodiversity Information Facility (GBIF, http://www.gbif.org/occurrence, as of January 26, 2019) was searched, and countries with occurrences of the given species are shown with an asterisk (*). Distributions known only from the literature are shown with double asterisks (**). Those with both information are shown with triple asterisks (***)

All the specimens used in this study are housed in the Department of Botany, National Museum of Nature and Science (TNS), Tsukuba, Japan.

DNA extraction and sequencing followed Hosaka and Castellano (2008). Obtained isolates will be deposited in NITE National Bioresource Center (NBRC). The obtained DNA vouchers are deposited in the Center for Molecular Biodiversity Research, National Museum of Nature and Science (Tsukuba, Ibaraki, Japan) and available for molecular phylogenetic researches.

Descriptions

1. Brunnipila clandestina (Bull.) Baral, Beih.

MycoBank. MB104069


Apothecia gregarious, superficial, forming urceolate cup to almost flat disc, 0.3–1 mm in diameter, stipitate, up to 1 mm high, dark brown (4635PC = C13 M53 Y68 K40), externally covered with brown hairs mostly capitate. Disc concave, white to pale yellow (7499PC = C1 M2 Y20 K0) when fresh and dry. Ectal excipulum textura angularis to prismatica composed of hyaline to pale brown (4655PC = C6 M38 Y42 K18) cells; cells 3–17 × 3–12 μm, slightly thick-walled. Medullary excipulum textura intricata of hyaline hyphae up to 2.5 μm wide. Hairs straight, cylindrical with slightly rounded apices, up to 120 × 3.5–5 μm, brown (471PC = C5 M70 Y97 K20) with pale brown or hyaline apices, totally granulate, thin-walled except for the apical cell slightly thick-walled, septate every 10–30 μm except for one or two apical cells with

Fig. 2. Brunnipila clandestina (TNS-F-81486). A. Ascospores. B. Ectal excipular outer cells. C. Vertical section through the margin, showing the hairs and ectal excipulum. D. Asci. E. Paraphyses. F. Hairs with and detached (left) crystals. G. Apothecium.
3–5 μm septation; apex crowned by crystal masses easily detached in squash mounts. **Asci** 41–47 × 3.2–4.5 μm, 8-spored, cylindrical-clavate; apical pore blue in Melzer’s reagent without 3% KOH pretreatment; croziers absent at the basal septa; basal cells usually form more than two asci. **Ascospores** 5.8–9 × 1.2–2 μm, ellipsoid to fusiform, aseptate.

**Paraphyses** straight, lanceolate, up to 5 μm wide, septeate, exceeding the asci 20–30 μm.


Ecology. Saprophytic on dead twigs of Rubus idaeus, sometimes on dead twigs or stems of other plants.


Notes. Baral and Krieglsteiner (1985) reported *B. clandestina* coexisted with *Capitotricha rubi* (Bres.) Baral and *Lachnum virgineum* (Batsch) P. Karst., on the same substrate (*R. idaeus*). We also observed *B. clandestina* shared the twig of *R. idaeus* with *C. rubi* in TNS-F-81486 (Fig. 1B).

**Brunnipila clandestina**, the type species of **Brunnipila** Baral, is widely distributed corresponding to the distribution of its host plant *Rubus idaeus*. In Japan, two occurrences of *B. clandestina* (TNS-F-50486 and TNS-F-50462, registered as *Dasyscyphus clandestinus*) collected by Yoshio Otani, were found in GBIF. However, as a result of our re-examination, TNS-F-50486 and 50462 were found to be *Trichopeziza* sp. and *Lachnum pseudocannabinum* (Raitv.) Raitv. respectively. TNS-F-81486 is therefore the first record of *B. clandestina* from Japan.

2. **Brunnipila pseudocannabinua** (Raitv.) Tochihara, Sasagawa & Hosoya **comb. nov.**

MycoBank. MB829699


**Apothecia** gregarious, superficial, cup-shaped, 0.6–1.4 mm in diameter, stipitate, up to 1 mm high, dark brown (Panton 4635PC = C13 M53 Y68 K40), externally covered with capitate hairs. **Disc** concave, white when fresh and dry. **Ectal excipulum** *textura prismatica* to *angularis*, with cells 2–13 × 2–12 μm, hyaline, thick-walled up to 2 μm thick. **Medullary excipulum** *textura intricata* of hyaline hyphae up to 3 μm wide. **Hairs** straight, cylindrical with slightly rounded apices, up to 200 × 4–5 μm, brown (471PC = C5 M70 Y97 K20) with pale brown or hyaline apices, totally granulated, thin-walled, slightly thick-walled in one or two cells at the apices; apex crowned by crystal masses easily detached in squash mounts. **Asci** 57–70 × 5.5–6 μm, 8-spored, cylindrical-clavate; pore blue in Melzer’s reagent without 3% KOH pretreatment; croziers present at the base. **Ascospores** 10–15 × 2–3 μm, slightly long fusiform, sometimes irregularly curved, aseptate or rarely one-septate, containing some small lipid bodies. **Paraphyses** straight, lanceolate with acute apices, up to 5 μm wide, septeate, exceeding the asci for 25–30 μm.


Ecology. Saprophytic on dead stems of tall herbaceous plants.

Previously known distribution. Kunashir
Island (type locality) ***, Sakhalin***, Kamchatka *** (Raitviir, 1977; 1991).

Notes. TNS-F-16691 was examined in Hosoya et al. (2010) and determined as an unidentified lachnaceous species *Lachnum sp. 4*. Our re-examination revealed the six specimens of *Lachnum sp. 4* were *B. pseudocannabinum*, in agreement with the original description of Raitviir (1977).

Raitviir (1991) included *L. pseudocannabinum* in section *Brunnipila* (Baral) Raitv., subgenus *Belonidium*, genus *Lachnum* Retz. together with *L. cannabinum* (= currently *B. cannabina*), *L. clandestinum* (= currently *B. clandestina*) and *L. fuscidulum* focusing on stipitate apothecia and brown, hairs equipped with crystals. Since molecular phylogenetic analysis (Hosoya et al., 2010) concluded that *Lachnum sp. 4* was positioned in the *Brunnipila clade*, and we propose...
to transfer *L. pseudocannabinum* to the genus *Brunnipila*. As we have not examined specimens of *L. fuscidulum*, we hesitate to propose a new combination for *L. fuscidulum*.

*Brunnipila pseudocannabina* differs from *B. cannabina* (Rehm) Raitv. & Järv, in having larger asci >55 μm (Raitviir, 1991). Raitviir (1979, 1991) pointed out this fungus was endemic to the Far East while *B. cannabina* was widely distributed throughout Russia and Europe. *Brunnipila pseudocannabina* distribution probably includes also the subarctic zone, from north of Central Honshu to Kamchatka.

*Brunnipila pseudocannabina* usually shares the same substrate with other lachnaceous fungi, such as *Lachnum nudipes* (Fuckel) Nannf. (Fig. 3B), which is found on decaying stems of tall herbs. Species of *Trichopezizella* are similar to *B. pseudocannabina* at first glance, but differ in having sessile to stipitate apothecia and smooth hairs lacking crystals.

For Japan, *B. fuscescens* (Pers.) Baral and *B. palearum* (Desm.) Baral have been included in the genus *Brunnipila* (Katsumoto, 2010). *B. pseudocannabina* transfer is made in this study.

[MycoBank. MB104378]


Atractobolus scintillans (Massee) Kuntze, Revis. gen. pl. (Leipzig) 3 (2): 446. 1898.


**Apothecia** scattered, superficial, very minute, at first spherical and later urceolate, 0.1–0.2 mm in diameter, subsessile to sessile, up to 0.2 mm high,

externally covered with short, white, stiff, capitata hairs. Disc concave, almost enclosed by an incurving margin when fresh and dry. Ectal excipulum textura prismatica composed of cubic cells like stone pavings with granulated surface, 3–10 × 5–13 μm, hyaline, thick-walled up to 2 μm wide; cells arranged in parallel rows. Medullary excipulum textura intricata of hyaline hyphae up to 2 μm wide. Hairs straight, cylindrical with rounded apices, 55–80 × 5.5–7.5 μm, 2–3-septate, hyaline, totally granulate, thin to slightly thick-walled towards the base, very thick-walled up to 3 μm wide in one or two cells at the apices; apex crowned by crystal masses easily detached in squash mounts. Asci 26.5–35 × 2–3.8 μm, 8-spored, cylindrical-clavate; pore blue in Melzer’s reagent without 3% KOH pretreatment; croziers absent at the basal septa. Ascospores 4.5–10 × 1–1.2 μm, slightly long fusiform, aseptate, containing some small lipid bodies. Paraphyses straight, lanceolate, up to 4 (~5) μm wide, aseptate, exceeding the asci by 20 μm.


Ecology. Saprophytic on dead leaves of Quercus.

Previously known distribution. USA***.

Notes. _Incrucipulum capitatum_ is characterized by having lanceolate paraphyses, very-thick-walled and short hairs, and occurring on _Quercus_ leaves. Morphology and the host plant correspond descriptions by Peck (1878), Dennis (1949), Seaver (1951) and Raitviir (1969). _Incrucipulum capitatum_ is newly documented from Asia (including the Far East) in this study. In Japan, _Incrucipulum ciliare_ (Schrad.) Baral is present covering a wide area on _Quercus_ leaves, while _I. capitatum_ is rare. Since the host _Quercus_ species are distributed in temperate zones, _I. capitatum_ should be widely distributed in the temperate zones.

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References