A new species of Marasmius Sect. Neosessiles (Basidiomycota, Agaricales) from the artificial Dipterocarpaceae forest in Indonesia

Atik RETNOWATI1,2, Jaya Seelan Sathiya SEELAN2

I. Herbarium Bogoriense, Research Center for Biology, The National Research and Innovation Agency, Jalan Raya Jakarta Bogor, Km. 46, Cibinong 16911, Indonesia. 2. Mycology and Pathology Laboratory, Institute for Tropical Biology and Conservation (ITBC), Universiti Malaysia Sabah, 88400 Kota Kinabalu, Sabah, Malaysia. *Corresponding author’s Phone: +62-21-8765057; Mobile phone: +62-081804954805; Fax: +62-21-8765063; Email: marasjamur@gmail.com

(Manuscript received 19 July 2021; Accepted 3 December 2021; Online published 5 January 2022)

ABSTRACT: Marasmius jasingensis (Agaricales, Marasmiaceae), is described as a new species from Haurbentes, the artificial Dipterocarpaceae forest in West Java, Indonesia. The new species is distinguished by having a small basidiomata with orbicular, pale orange pileus, distant lamellae, a stipe being absent or rudimentary, Rotalis-type cheilocystidia, pleurocystidia, and pileipellis cells. Morphologically, it is similar to M. sejunctus, M. conchiformis, M. spaniophyllus Berk., M. sessiliaffinis and M. griseoroseus. Comprehensive descriptions, illustrations, and comparisons with similar taxa are presented.

KEY WORDS: Fungal diversity, Java, Marasmiaceae, marasmioid fungi, taxonomy.

INTRODUCTION

The genus Marasmius is one of the largest genera in the family Marasmiaceae with about 500 species (Kirk et al., 2008) distributed mainly throughout tropical and subtropical areas of the world. The members of the genus can be easily recognized by tough, dry, persistent basidiocarps, tough, subdistant lamellae, with entire, sharp edges, and a cartilaginous stipe. Most of them are saprotrophic, some are parasitic, whereas mycorrhizal association have not yet been confirmed.

Traditionally, the genus consists of 12 sections which are separated on the basis of the structure of the pileipellis, and of tissue and cellular reactions to Melzer’s reagent. The sections were Androsacei, Hygrometrici, Epiphylli, Marasmius, Alliacei, Globulares, Sicci, Levellaeani, Scotophyssini, Inaequales, Fusicystides, and Neosessiles (Singer, 1986). Many years after Singer (1986), a new concept of the sectional level was suggested by Antonin and Noorderloos (2010). Supported by molecular data, they suggested that section Globulares is characterized by forming a hymeniform pileipellis consisting of Siccus-type broom cells and/or smooth cells. Furthermore, Desjardin and Petersen (1989) mentioned that Neosessiles was an artificial group that shares features with other sections. In order to clearly define the section, more studies using more species are needed. Currently several sections have been elevated to new genera. Antonin (1987) separated section Androsacei from the genus Marasmius, and proposed a new genus Setulipes Antonin which is a member of Omphalotaceae. In addition, the genus Cryptomarasmius was proposed to accommodate Marasmius section Hygrometrici which belongs to the family Physalacriaceae (Jenkinson et al., 2014). Wilson and Desjardin (2005) transferred members of Marasmius section Alliacei to the genus Mycetinis which belongs to Omphalotaceae.

Among the 12 sections, Neosessiles is one of the smallest and least studied (Oliveira and Capelari, 2012). Singer (1986) mentioned that the section Neosessiles was characterized by pleurotoid basidiomata, a hymeniform pileipellis, medium to large basidiospores, a rudimentary, oblique or eccentric stipe, pseudoamyloid (= dextrinoid) or exclusively inamylloid hyphae with or without clamp connections. Eleven species of the section are reported from the Neotropics (Singer, 1976), five species from Africa (Antonin, 2007), three species from Madagascar (Shay et al., 2017, Antonin and Buyck, 2006), and one species each from Malaysia (Tan et al., 2009), Thailand (Wannathes et al., 2009), Hawaii (Desjardin and Hemmes, 2011), and Sri Lanka (Pegler, 1986), and five species from Brazil (Oliveira et al., 2014).

Currently, about 50 species of the Indonesian Marasmius species (Marasmius, Sicci, Globulares) have been reported from Java, Bali and Kalimantan (Desjardin et al., 2000, Retnowati, 2008, 2010). In addition, one species of the section Neosessiles, M. tenuissimus, had been collected by Junghuhn (Singer, 1976). In this paper, another species of sect. Neosessiles in the concept of Singer (1986) from Indonesia, namely M. jasingensis, is described and illustrated as a new species.

MATERIALS AND METHODS

Specimens of Marasmius were collected from Haurbentes forest, Jasinga, Bogor, West Java. Geographically, Haurbentes is located between 6°32’–6°33’ South Latitude and 106°26’ East Longitude. The total area of the forest is 105.5 ha, and it is dominated by the genus Shorea (Dipterocarpaceae). The average rainfall is 4267
mm/year; the climate is categorized as a wet climate (Erizilina et al. 2019) (Fig. 1).

Macro- and micromorphological characters are described and illustrated based on fresh and dried fungal specimens. Microscopic observation was made on material mounted in 3% KOH, Congo red and Melzer’s reagent. Colour notation was determined using Kornerup and Wanscher (1978). Specimens examined are deposited in Herbarium Bogoriense, Indonesia (BO).

All line drawings of the micro-characters were made with the aid of a camera lucida attached to a compound microscope using 40× or 100× (oil immersion) objectives. Spore range was obtained by measuring 25 mature basidiospores. Basidiospore statistics include: the arithmetic mean of the spore length by spore width (± standard deviation) for n spores measured in a single specimen (x̄m); the range of variation in n basidiospores measured (Q); the mean of Q-values in a single specimen (Qm) (Retnowati et al. 2020).

TAXONOMIC TREATMENT

**Marasmius jasingensis** Retn. & Sathiya Seelan, sp. nov. Figs. 2–4.

*Mycobank*: MB#841420

*Type*: Indonesia, West Java Province, Jasinga, artificial Dipterocarpaceae forest “Haurbentes”, Forestry Department, on dicot wood, 4 June 2009, A. Retnowati 653 (BO).

**Description**: Basidiomata small. Pileus 1–2.5 mm diameter, orbicular, sulcate, non-striate, margin straight to slightly incurved; surface dull, dry; pale orange. Context thin, pale orange. Lamellae adnate, subdistant (5–7 attached lamellae), 0–1 series of lamellulae, non-anastomosing, non-marginate, concolorous with pileus. Stipe absent or rudimentary, without mycelial pad. Odor and flavor not distinctive.

Basidiospores (6.5)7–9.3(9.9) × (3.4)3.6–4.6(5.4) μm [x̄m = 7.91 ± 1.04 × 4.09 ± 0.58; Q = 1.63–2.22; Qm = 1.94 ± 0.16; n = 25 spores from 1 specimen], ellipsoid, thin-walled, smooth, hyaline, inamyloid. Basidia 18.7–23.4 × 5.9 μm, 2–4-spored, clavate. Basidioles clavate, fusoid with tapering apex. Cheilocystidia common, *Rotalis*-type broom cells; main body 10–21 × 9–13 μm, clavate to broadly clavate, or subglobose, hyaline, thin-walled; setulae 0.7–1.8 × 0.21–0.84 μm, conical to narrowly conical, obtuse, some with very crowded apical setulae up to the upper half of the cells. Pleurocystidia common, *Rotalis*-type broom cells; main body 8.8–23 × 8.4–17 μm, clavate to broadly clavate, or subglobose, hyaline, thin-walled; setulae 0.7–1.8 × 0.21–0.84 μm, conical to narrowly conical, obtuse, crowded, thin- to thick-walled, hyaline. Pileipellis hymeniform, composed of *Rotalis*-type broom cells; main body 8.8–23 × 8.4–17 μm, clavate to broadly clavate, or subglobose, or irregular in outline, hyaline, thin- to thick-walled; setulae 0.6–2 × 0.5 μm, narrowly cylindrical to conical, obtuse, crowded, thin- to thick-walled, hyaline. Pileal trama composed of interwoven hyphae being 3–11 μm wide, thin to thick-walled, inamyloid. Clamp connections present.
**Etymology:** The epithet *jasingensis* refers to Jasinga, the name of the district where Haurbentes forest is located.

**Distribution:** Indonesia (Java).

**Habit and habitat:** Pleurotoid, gregarious on undetermined dicot wood.

**Notes:** *Marasmius jasingensis* is considered a member of the *Marasmius* sect. *Neosessiles* because of pleurotoid habit, forming a hymeniform pileipellis and the absence of a stipe. This new species is characterized by having small basidiomata, an orbicular, pale orange pileus, distant lamellae, *Rotalis*-type of cheilocystidia, pleurocystidia, and pileipellis cells. The presence of *Rotalis*-type broom cells is different from most of the described species of *Marasmius* sect. *Neosessiles* mostly having *Siccus*-type broom cells.

*Marasmius jasingensis* is similar to few other described species with a pleurotoid habit and the presence of *Rotalis*-type cells of *Marasmius* sect. *Neosessiles* viz *M. sejunctus* Singer, *M. conchiformis* J.S. Oliveira & Capelari, and *M. spaniophyllus* Berk., *M. sessilaffinis* Singer, and *M. griseoroseus* (Mont.) Singer, but it can be distinguished from them by several characters (Table 1). *Marasmius sejunctus* differs in having reddish-brown pileus when dried, the presence of a stipe, *Siccus*-type broom cells in the pileipellis with transition to *Rotalis*-type broom cells, the presence of *Siccus*-type cheilocystidia and caulocystidia, and fusoid pleurocystidia (Singer 1976). *Marasmius conchiformis* from Brazil differs in having larger basidiomata, higher

---

**Fig. 3.** *Rotalis*-type broom cells of *M. jasingensis*. A–E: Pleurocystidia; F–J: Cheilocystidia; and K–O: Pileipellis. Scale bars: = 7 μm (A–J); 10 μm (K–O).

**Fig. 4.** *Marasmius jasingensis*: A. Basidiospores; B. Basidia-basidioles; C. Pleurocystidia; D. Cheilocystidia, and E. Pileipellis. (drawn by A. Retnowati from A. Retnowati 653).
Table 1. Morphological characters *M. jasingensis* and other similar species of *Marasmius* sect. *Neosessiles*.

<table>
<thead>
<tr>
<th>Character</th>
<th><em>M. jasingensis</em></th>
<th><em>M. sejunctus</em></th>
<th><em>M. conchiformis</em></th>
<th><em>M. spaniophyllus</em></th>
<th><em>M. sessiliaffinis</em></th>
<th><em>M. griseoroseus</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pileus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>1–2.5 mm diam.</td>
<td>2–3.5 mm diam.</td>
<td>1–4.5 mm diam.</td>
<td>5–7 mm diam.</td>
<td>2–14 mm diam</td>
<td>0.8–6 mm diam</td>
</tr>
<tr>
<td>Shape</td>
<td>Orbicular</td>
<td>Reniform</td>
<td>Convex, orbicular</td>
<td>Reniform</td>
<td>reniform</td>
<td>Semicircular</td>
</tr>
<tr>
<td>Colour</td>
<td>Pale orange</td>
<td>Dried collection reddish-brown</td>
<td>Buff orange</td>
<td>Brown</td>
<td>light brown to pale yellowish fuscous</td>
<td>pale orangy beige</td>
</tr>
<tr>
<td>Lamellae</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>5–7</td>
<td>3–4 then 8–10 attached</td>
<td>7–8</td>
<td>3–6</td>
<td>4–7</td>
<td>4–8</td>
</tr>
<tr>
<td>Series of lamellae</td>
<td>Present, 0–1 series</td>
<td>Present, -</td>
<td>Present, 3 series</td>
<td>-</td>
<td>1–2</td>
<td>1–2</td>
</tr>
<tr>
<td>Spaces</td>
<td>Subdistant</td>
<td>Subclose when mature</td>
<td>Subdistant subdistant</td>
<td>Subdistant subdistant to distant</td>
<td>subdistant to distant</td>
<td>present</td>
</tr>
<tr>
<td>Anastomoses</td>
<td>Anastomoses absent</td>
<td>A few anastomoses when mature</td>
<td>-</td>
<td>With smooth interlamellar spaces</td>
<td>sometimes present</td>
<td>present</td>
</tr>
<tr>
<td>Stipe</td>
<td>Absent</td>
<td>Present</td>
<td>Absent or short</td>
<td>Present</td>
<td>present</td>
<td>none or rudimentary</td>
</tr>
<tr>
<td>Basidiospores</td>
<td>(6.5) 7–9.3(9.9) × (3.4)3.6–4.6 (5.4) μm</td>
<td>7–10 × 3–6 μm</td>
<td>8–11.8 × 3–5 μm</td>
<td>10.5–12.3 × 5.3–6 μm</td>
<td>7.8–9.7 × (4)4.7–5.5 μm</td>
<td>(9)10–14.4×2.3–4 μm</td>
</tr>
<tr>
<td>Cheilocystidia</td>
<td><em>Rotalis</em>-type</td>
<td><em>Siccus</em>-type</td>
<td><em>Siccus</em>-type</td>
<td><em>Siccus</em>-type</td>
<td><em>Siccus</em>-type</td>
<td><em>Siccus</em>-type</td>
</tr>
<tr>
<td>Pleurocystidia</td>
<td><em>Rotalis</em>-type</td>
<td>Fusoid, often subrostrate</td>
<td>Cylindrical-clavate</td>
<td>Hymeniform of <em>Siccus</em>-type broom cells, appearing transitional to <em>Rotalis</em>-type broom cells</td>
<td>-</td>
<td><em>Siccus</em>-type broom cells in transition to <em>Rotalis</em>-type</td>
</tr>
<tr>
<td>Pileipellis</td>
<td><em>Rotalis</em>-type</td>
<td>Transition <em>Siccus</em>-<em>Rotalis</em>-type</td>
<td>-</td>
<td>Broom cells tending to be <em>Rotalis</em>-type</td>
<td><em>Siccus</em>-type broom cells in transition to <em>Rotalis</em>-type</td>
<td></td>
</tr>
<tr>
<td>Caulocystidia</td>
<td>-</td>
<td><em>Siccus</em>-type broom cells</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Clamp Connection</td>
<td>present</td>
<td>present</td>
<td>present</td>
<td>present</td>
<td>present</td>
<td>present</td>
</tr>
</tbody>
</table>

number of lamellae and lamellulae, larger basidiospores, cylindrical-clavate pleurocystidia, chelioxyctidia in the form of *Siccus*-type broom cells, and pileipellis cells of the *Siccus*-type with transients to the *Rotalis*-type (Oliveira et al., 2014). *Marasmius spaniophyllus*, described also from Brazil differs from *M. jasingensis* by having a large pileus, the presence of a stipe, larger basidiospores, pileipellis composed of *Siccus*-type broom cells which tend to be *Rotalis*-type broom cells (Singer 1976). The new species is also similar to *M. sessiliaffinis*. However, *M. sessiliaffinis* is sharply distinct from the new species by pileus colour (light brown to pale yellowish fuscous vs. pale orange), size of pileus (2–14 mm vs. 1–2.5 mm diam.), and type of pileipellis (*Siccus* vs. *Rotalis*-type broom cells) (Singer 1976). *Marasmius griseoroseus* differs from the new species in having larger basidiospores, *Siccus*-type broom cells in transition to *Rotalis*-type of chelioxyctidia and pileipellis (Oliveira et al., 2014).

ACKNOWLEDGMENTS

The authors thank Herbarium Bogoriense, Research Center for Biology, for providing the collecting permit. The trip to Haurbentes was supported by Nagao Foundation, Japan, to Atik Retnowati.

LITERATURE CITED


