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The species of *Marasmiellus* (Agaricales: Omphalotaceae) from Java and Bali

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ABSTRACT. A total of 35 species of *Marasmiellus* Murrill belonging to five sections (*Dealbati*, *Rameales*, *Marasmiellus*, *Stenophylloides*, and *Candidi*) are described from Java and Bali. Sixteen taxa are described as new species: *Marasmiellus bisporus* Retn., *M. cibodasensis* Retn., *M. cikanikiensis* Retn., *M. clavatus* Retn., *M. desjardinii* Retn., *M. diverticulatus* Retn., *M. haurbentesis* Retn., *M. javanicus* Retn., *M. longisiccus* Retn., *M. pipericola* Retn., *M. pruinosus* Retn., *M. reniformis* Retn., *M. rifaii* Retn., *M. subglobosus* Retn., *M. tamblinganensis* Retn. and *M. zingibericola* Retn. Two new combinations are made: *M. nugatorius* (Corner) Retn. and *M. pangerangensis* (Henn.) Retn. Comprehensive descriptions, illustrations, and comparisons with similar taxa are presented. Eight names are lectotypified.

Keywords. Gymnopoid fungi, *Gymnopus*, lectotypification, marasmioid genera, saprophytic fungi

Introduction

The genus *Marasmiellus* Murrill is widely distributed throughout tropical and subtropical areas of the world. *Marasmiellus* consists of more than 250 species (Kirk et al., 2008). It is a neglected genus compared to other marasmioid genera (*Marasmius* Fr., *Mycena* (Pers.) Roussel, *Micromphale* Gray, etc), due to its small basidiocarps, uncolourful pileus, and low variation in the morphological characters. The lack of variation in the morphological characters makes it difficult to delimit species of *Marasmiellus*.

Along with other tropical and subtropical basidiomycetous fungi, the genus *Marasmiellus* plays a significant ecological role in tropical forests. Its species are saprophytic, degrading leafy and woody debris. A few species are parasitic and attack various economically important plants, i.e., bananas, sugar cane, maize, and coconut palms (Singer, 1973).

The genus *Marasmiellus* is not monophyletic (Wilson & Desjardin, 2005; Mata et al., 2004). In a phylogenetic treatment of gymnopoid fungi based on nLSU data, Wilson & Desjardin (2005) found a *Marasmiellus* clade, which included the type species of *Marasmiellus (M. juniperinus* Murrill) and several *Gymnopus* (Pers.) Gray

species, and a *Gymnopus* clade, which included the type species of *Gymnopus* (*G. fusipes* (Bull.) Gray) and several *Marasmiellus* species. In contrast, Mata et al. (2004) accepted *Marasmiellus* as a synonym of *Gymnopus*. The controversy of whether to accept *Marasmiellus* as distinct from *Gymnopus* or as a synonym of the latter is not yet settled. For this treatment, the Javanese and Balinese species are treated in *Marasmiellus*, following the generic concept of Singer (1973).

Singer (1973) described 134 species of Neotropical *Marasmiellus*. This monograph is the most complete published paper on *Marasmiellus* and is the basic reference for all subsequent taxonomic work on the genus *Marasmiellus*. Pegler (1977, 1983, 1986) made a significant contribution to our knowledge of worldwide Agaricales by publishing several regional monographs. In these, he reported 14 species of *Marasmiellus* from East Africa (Pegler, 1977), 23 species from the Lesser Antilles (Pegler, 1983), and 17 species from Sri Lanka (Pegler, 1986). Twenty-one species of *Maramiellus* were reported by Antonín & Noordeloos (1993) from Europe. Most of them are widespread, cosmopolitan taxa, with some species from subtropical regions. Desjardin (1997) reported 7 species of *Marasmiellus* from eastern North America. To date, there are only a few reports of *Marasmiellus* species in Indonesia (Desjardin et al., 2000).

Materials and methods

Macro- and micromorphological characters are described and illustrated based on fresh and dried fungal specimens collected from several locations in Java and Bali. Microscopic observation was made on material mounted in 3% KOH. Colour notation was determined using Kornerup & Wanscher (1978) (in the descriptions these appear as, for example, 12E5–6; 12F5). Specimens examined are deposited in Herbarium Bogoriense (BO) and the Harry D. Thiers Herbarium (SFSU) at San Francisco State University, USA.

All line drawings of the micro-characters were made with the aid of a camera lucida attached to a compound microscope using 40x or 100x (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 (x_m); the range of spore means (x_{mr}), and the mean of spore means (± SD) when more than one specimen is available (x_{mm}); the quotient of basidiospore length and basidiospore width in any one basidiospore, indicated as a range of variation in n basidiospores measured (Q); the mean of Q-values in a single specimen (Q_m); the range of Q_m-values where more than one specimen is available (Q_{mr}); and the mean of Q_m-values where more than one specimen is available (Q_{mm}).

Key to sections and species of *Marasmiellus* in Java and Bali

Key to sections of *Marasmiellus*

1a. Basidiomes pleurotoid. Stipe not well developed, absent or reduced, lateral or strongly eccentric. Pileipellis composed of a *Rameales*-structure, or a cutis with scattered diverticulate hyphae ..... sect. *Marasmiellus*
1b. Basidiomes gymnopoid. Stipe well developed, present, central. Pileipellis composed of a *Rameales*-structure or cutis 2

2a. Pileipellis composed of a *Rameales*-structure, interwoven, with differentiated terminal cells 3
2b. Pileipellis composed of cutis-structure, non-interwoven, lacking differentiated terminal cells 4

3a. Sclerocystidia/setae absent ..... sect. *Rameales*
3b. Sclerocystidia/setae present ..... sect. *Stenophylloides*

4a. Cheilocystidia of clavate to cylindrical or lageniform cells, smooth or with a few diverticula over the upper half ..... sect. *Candidi*
4b. Cheilocystidia absent or present, if present of *Siccus*-type broom cells, with setulae at the apex ..... sect. *Dealbati*

Key to species of *Marasmiellus* sect. *Marasmiellus*

1a. Pileus pigmented, ranging from orange, pale brown, pinkish orange to greyish purple. Hymenophore with 3–4 series of lamellulae 2
1b. Pileus not pigmented, ranging from white, off-white, cream, buff to beige. Hymenophore with fewer than 3 series of lamellulae 6

2a. Stipe present and strongly eccentric 3
2b. Stipe absent 5

3a. Pileus up to 15 mm diam., greyish purple. Lamellae intervenose absent. Found on banana stems. Cell-walled incrustation on pileipellis ..... 1. *M. purpureoalbus*
3b. Pileus up to 22 mm diam., not greyish purple. Lamellae intervenose present. Found on dicots. No incrustation on pileipellis 4

4a. Basidiospores subglobose, mean 9.3 × 6.7 µm. Cheilocystidia absent .... 2. *M. subglobosus*
4b. Basidiospores ellipsoid, mean 8.3 × 4.3 µm. Cheilocystidia present .... 3. *M. inodermatoides*

5a. Odour strongly of garlic. Lamellae intervenose ..... 4. *M. ignobilis*
5b. Odour indistinct. Lamellae not intervenose ..... 5. *M.* aff. *concolor*

6a. Pileipellis composed of a *Rameales*-structure 7
6b. Pileipellis composed of parallel hyphae without diverticula 10

7a. Basidiocarps reniform to convex. Lamellae intervenose. Hyphae of stipe non-diverticulate, coralloid stipe vesture present ..... 6. *M. epochnous*
7b. Basidiocarps convex with flattened disc or broadly convex. Lamellae not intervenose. Hyphae of stipe with diverticula, stipe vesture absent 8

8a. Pileus small, up to 10 mm diam. Lamellae distant with 1–2 series of lamellulae. Stipe up to 5 mm long 9
8b. Pileus larger, up to 39 mm diam. Lamellae subdistant with 2–3 series of lamellulae. Stipe up to 15 mm long ..... 7. *M. zingibericola*

9a. Stipe glabrous. Basidiospores 12–15.2 × 5.6–6.4 µm. Hymenial cystidia absent. Stipe vesture absent ..... 8. *M. rifaii*
9b. Stipe pruinose. Basidiospores 7.2–8.8 × 3.2–4.8 µm. Hymenial cystidia present. Stipe vesture present ..... 9. *M. nugatorius*

10a. Lamellae well-developed, not anastomosed or intervenose, lamellulae in 2–5 series 11
10b. Lamellae poorly developed, anastomosed or intervenose, lamellulae in 1–2 series 12

11a. Pileus pure white to off-white or cream. Lamellae cream to off-white or white. Stipe pruinose, stipe vesture of clavate to cylindrical caulocystidia .... 10. *M. pangerangensis*
11b. Pileus sometimes staining bright yellow. Lamellae with pinkish tint. Stipe glabrous, stipe vesture absent ..... 11. *M. reniformis*

12a. Basidiospores > 8.8 µm long ..... 12. *M. haurbentesis*
12b. Basidiospores < 8.8 µm long 13

13a. Stipe vesture absent 14
13b. Stipe vesture common, composed of clavate to cylindrical cells 15

14a. Cheilocystidia of *Siccus*-type broom cells with a few setulae. Pileipellis a cutis of non-diverticulate and non-incrusted hyphae ..... 13. *M. longisiccus*
14b. Cheilocystidia absent. Pileipellis a cutis of diverticulate and pigment-incrusted hyphae ..... 14. *M. bolivarianus*

15a. Lamellae white, staining reddish brown with age. Pileus surface suede-like. Pileipellis terminal cells undifferentiated ..... 15. *M. pernambucensis*
15b. Lamellae white, not staining with age. Pileus surface glabrous. Pileipellis terminal cells with short setulae ..... 16. *M. idroboi*

Key to species of *Marasmiellus* sect. *Rameales*

1a. Basidiocarp small. Pileus up to 20 mm diam., convex to plano-convex, or broadly convex often with or without flattened shallowly depressed disc 2
1b. Basidiocarp large. Pileus up to 50 mm diam., convex to plane with depressed disc 7

2a. Pileus not pigmented, ranging from pure white to light yellow, light brown, beige, or soda brown 3
2b. Pileus pigmented, ranging from light brown overall, off-white at the margin, orangish brown or cream with brownish/pink to reddish brown at centre, turning dark red-brown with age 8

3a. Lamellae close to crowded with multiple series of lamellulae .... 17. *M. clavatus*
3b. Lamellae subdistant or distant with few series of lamellulae 4

4a. Cheilocystidia present 5
4b. Cheilocystidia absent 6

5a. Cheilocystidia of *Siccus*-type broom cells with apical setulae .... 18. *M. tamblinganensis*
5b. Cheilocystida fusoid to clavate or broadly clavate with a few diverticula .... 19. *M. setulosipes*

6a. Lamellae edge not serrate. Stipe up to 15 mm long, non-insititious, arising from a thin subiculum on the substrate ..... 20. *M. delicius*
6b. Lamellae edge serrate. Stipe up to 6 mm long, insititious, without a subiculum on the substrate ..... 21. *M. diverticulatus*

7a. Lamellae forked, nearly poroid, lamellulae absent ..... 22. *M. pipericola*
7b. Lamellae neither forked nor poroid, lamellulae present 8

8a. Lamellae edge granulose; stipe non-insititious ..... 23. *M. pruinosus*
8b. Lamellae edge non-granulose; stipe insititious 9

9a. Lamellae non-marginate or slightly orangish brown margin; stipe central with a small bulb at the base of stipe ..... 24. *M. umbilicatus*
9b. Lamellae non-marginate; stipe central to eccentric without a small bulb at the base of stipe ..... 25. *M. nanus*

Key to species of *Marasmiellus* sect. *Candidi*

1a. Pileus up to 45 mm diam., dingy cream, darkening with age and with drying. Basidiospores 13.6–17.6 µm long ..... 26. *M. subnigricans*
1b. Pileus up to 10 mm diam white, not darkening with age or with drying. Basidiospores 12–13.6 µm long ..... 27. *M. albofuscus*

Key to species of *Marasmiellus* sect. *Dealbati*

1a. Cheilocystidia absent 2
1b. Cheilocystidia present 4

2a. Pileus more than 10 mm diam. Lamellae distant. A small bulb absent at the stipe base ..... 28. *M. cikanikiensis*
2b. Pileus less than 10 mm diam. Lamellae subdistant. A small bulb present at the stipe base 3

3a. Pileus white to pale orange, turning yellow ..... 29. *M. desjardinii*
3b. Pileus light brown at first, becoming dark brown ..... 30. *M. cibodasensis*

4a. Cheilocystidia and caulocystidia similar, of *Siccus*-type cells .... 31. *M.* cf. *stenophyllus*
4b. Cheilocystidia of *Siccus*-type cells, caulocystidia of smooth cells 5

5a. Growth on dicotyledonous leaves. Stipe more than 7 mm long .... 32. *M. hirtellus*
5b. Grow on monocotyledonous wood or leaves. Stipe less than 7 mm long 6

6a. Lamellae anastomosing and intervenose ..... 33. *M.* aff. *hirtellus*
6b. Lamellae not anastomosing and intervenose ..... 34. *M. javanicus*

Marasmiellus* Section *Marasmiellus

1. *Marasmiellus purpureoalbus* (Petch) Singer, Sydowia 15: 57 (1961). – *Marasmius purpureoalbus* Petch, Trans. Brit. Mycol. Soc. 31: 43 (1948). – TYPE: Sri Lanka, Peradeniya, on decaying banana stem, August 1917, *Petch 5303* (holotype K). (Fig. 1, 2)

Pileus 10–15 mm diam., convex to plano-convex, rugulo-striate, dry, glabrous; greyish purple (12E5–6; 12F5) to paler greyish reddish purple (12D4–6). ***Context*** thick, concolorous. ***Lamellae*** adnate, distant (7–9) with 3–4 series of lamellulae,

Fig. 1. *Marasmiellus purpureoalbus* (Petch) Singer. From *D.E. Desjardin 7102*. (Photo: D.E. Desjardin)

broad, pale yellowish white (1–4A2) to buff, non-marginate. **Stipe** 3–5 × 1–1.5 mm, terete, strongly eccentric, solid, dry, pruinose, insititious, white to dingy buff. ***Odour and taste*** indistinctive. ***Basidiospores*** (10.4–)11.2–12.8(–13.6) × (5.6–)6.4–8 µm (x_m = 12.06 ± 0.69 × 7.17 ± 0.63, Q = 1.40–2.14, Q_m = 1.70 ± 0.18, n = 25 spores per 1 specimen), ellipsoid, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** 40–44 × 8–10.4 µm, clavate, 4-spored. ***Basidioles*** clavate. ***Cheilocystidia*** common, composed of *Siccus*-type broom cells; main body 15.2–24.8 × 8–11.2 µm, clavate to subglobose, with a few apical diverticula, thin-walled, hyaline; diverticula 1.6–4 × 0.8–2.4 µm, obtuse to conical, thin-walled, hyaline. ***Pleurocystidia*** absent. ***Pileipellis*** a cutis; hyphae 5.6–8 µm diam., incrusted, thin-walled, hyaline, inamyloid. ***Pileal trama*** interwoven; hyphae 3.2–7.2 µm diam., thin-walled, hyaline. ***Stipe tissue*** monomitic; hyphae 4–12 µm diam., cylindrical, parallel, thin-walled, hyaline, weakly incrusted, inamyloid. ***Stipe vesture*** common; caulocystidia 12–32 × 4.8–8 µm, fusoid to clavate, thin-walled, hyaline. ***Clamp connections*** present.

Distribution. Indonesia (Java), Sri Lanka (Peradeniya), Kenya, Tanzania.

Habit and habitat. Solitary on stems of banana in montane rain forest.

Specimen examined. INDONESIA: **West Java Province:** Bogor, Ciapus, Curug Nangka, slope of Mount Salak, 11 Jan 2000, *Desjardin 7102* (BO).

Notes. The field character for this species is the greyish purple pileus. It has been reported from *Musa* L. stems, *Lagerstroemia* L. bark, or dead stems of *Amomum* L.; the Javanese material grows on banana stems. A species similar to *Marasmiellus purpureoalbus* is *M. purpureus* (Berk. & M.A.Curtis) Murrill (Pegler, 1983). *Marasmiellus purpureus* is a northern hemisphere species that differs in having a larger pileus, 2 series of lamellulae, and shorter basidiospores (6–9 × 3.2–4.5 µm) (Pegler, 1983).

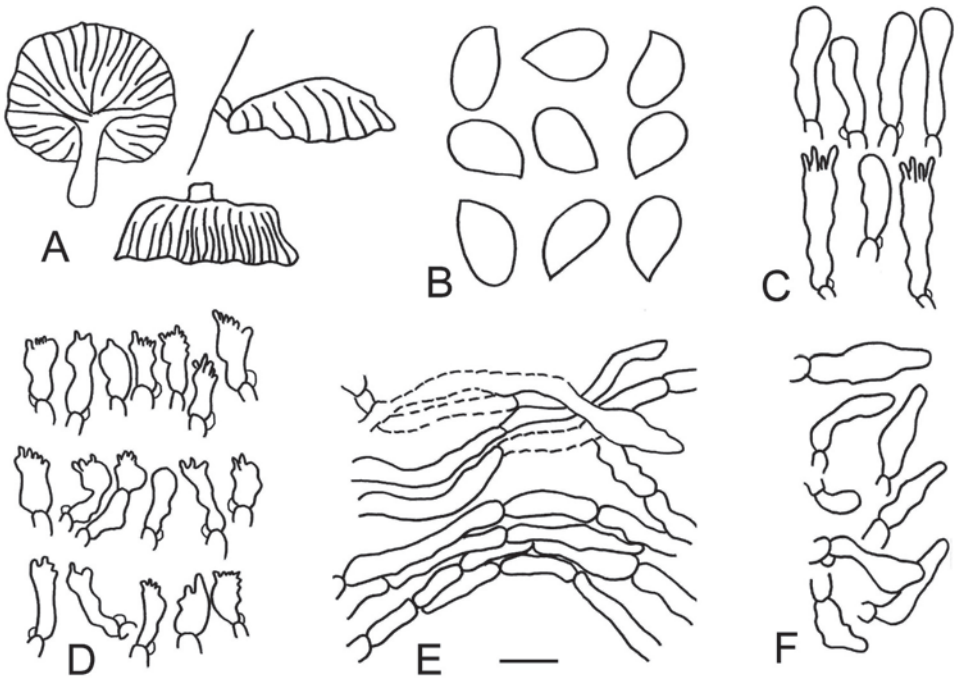

Fig. 2. *Marasmiellus purpureoalbus* (Petch) Singer. **A**. Basidiomes. **B.** Basidiospores. **C.** Basidia and basidioles. **D.** Cheilocystidia. **E.** Pileipellis. **F.** Caulocystidia. Scale bar: B = 10 µm; C–F = 20 µm. Drawn by A. Retnowati from *D.E. Desjardin 7102*.

2. *Marasmiellus subglobosus* Retn., **sp. nov.** – TYPE: Indonesia, Java, West Java Province, Cibodas Botanical Garden, 1423–1500 m asl, on wood, 11 January 2000, *A.W. Wilson 27* (holotype BO). Mycobank: MB 821677. (Fig. 3)

Pileus 2–22 mm diam., plano-convex to plane, round to reniform, uneven or undulate, rugulose to rugulo-striate, dull, dry, glabrous to minutely felted; margin entire, wavy, straight to greatly reflexed, buff to cream (4A3), greyish orange (6B3) or beige/flesh (5–6A3). ***Context*** unobserved. ***Lamellae*** shallowly adnate to adnexed, distant (7–11) with 3–4 series of lamellulae, forked to anastomosing or intervenose, narrow (0.1–0.5 mm), buff to pale orangish white (5A), or whitish beige (5A1–2). ***Stipe*** strongly eccentric to nearly lateral, 0.5–3 × 0.5–1.5 mm, cylindrical, dry, glabrous to pruinose, insititious, solid, white to light yellow (1–2A1) or cream (4A3). ***Odour and taste*** indistinctive. ***Basidiospores*** (7.2–)8–10.4(–12) × 5.6–8 µm (x_{mr} = 8.5–9.9 × 6.5–7, x_{mm} = 9.30 ± 0.7 × 6.71 ± 0.2, Q = 1.1–1.9, Q_{mr} = 1.26–1.51, Q_{mm} = 1.39 ± 0.1, n = 25 spores per 5 specimens), subglobose to broadly ellipsoid, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** 32–48 × 5.6–11 µm, clavate, 4-spored. ***Basidioles*** clavate. ***Cheilocystidia*** absent. ***Pleurocystidia*** absent. ***Pileipellis*** a cutis with diverticula; hyphae 2.4–8.8 µm diam., thin- to thick-walled (up to 1.6 µm), weakly incrusted, inamyloid. ***Pileal trama***

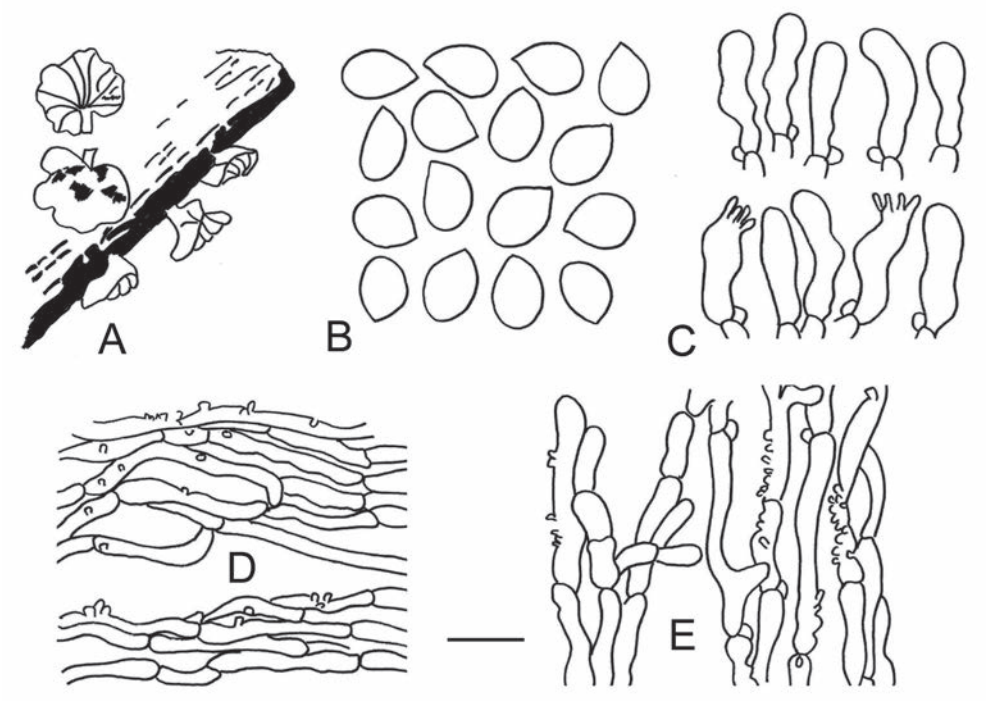

Fig. 3. *Marasmiellus subglobosus* Retn. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidia and basidioles. **D.** Pileipellis. **E.** Caulocystidia. Scale bar: B = 10 µm; C–E = 20 µm. Drawn by A. Retnowati from *A.W. Wilson 27*.

interwoven; hyphae 3.2–7.2 µm diam., thin- to thick-walled (up to 0.8 µm), inamyloid. ***Stipe tissue*** monomitic; hyphae 1.6–7.2 µm diam., parallel, cylindrical, thin-walled to thick-walled (up to 1.6 µm), diverticulate, inamyloid to weakly dextrinoid, hyaline. ***Stipe vesture*** uncommon to common; caulocystidia 10.4–36 × 4–5.6 µm, fusoid to clavate or irregular-shaped, thin- to thick-walled (up to 0.8 µm), hyaline, inamyloid to very weakly dextrinoid. ***Clamp connections*** present.

Distribution. Indonesia (Java).

Habit and habitat. Gregarious on bark of *Macropiper* Miq. or on wood.

Etymology. The epithet *subglobosus* refers to the shape of the basidiospores.

Additional specimens examined. INDONESIA: **West Java Province:** Sukabumi, Parung Kuda, Mount Halimun National Park, loop trail from Cikaniki, c. 1000 m asl, 8 Jan 1999, *Desjardin 6888* (BO, SFSU); Cibodas Botanical Garden, 22 Apr 2000, *Retnowati 250* (BO). **Central Java Province:** Purwokerto, Mount Slamet, Baturraden, Block 58, 22 Apr 2005, *Retnowati 542* (BO).

Notes. The species is characterised by the small, plano-convex to plane, round to reniform pileus, shallowly adnate, forked to anastomosing or intervenose lamellae with 3–4 series of lamellulae, eccentric to lateral stipe, small basidiospores, and numerous caulocystidia. This species is similar to *Marasmiellus stenophyllus* (Mont.) Singer (Singer, 1973). *Marasmiellus stenophyllus* differs from the Indonesian species in having a longer central stipe (6–15 × 0.5–1.7 mm) and smaller, elongate-ellipsoid basidiospores (6.8–8 × 2.7–3.5 µm) (Singer, 1973).

3. *Marasmiellus inodermatoides* Singer, Beih. Nova Hedwigia 44: 328 (1973). – TYPE: Bolivia, Beni, Vaca Diez, Guayaramerin, on fruits, branches, and logs of dicotyledonous trees in tropical rain forest, 9 March 1956, *R. Singer B 1720* (holotype F). (Fig. 4, 5)

Pileus 8–20 mm diam., irregularly convex to irregularly plano-convex, leaf-shaped in side view, oval in top view, smooth or minutely rugulose, becoming rugulo-striate with age, dull, dry, suede-like; disc pale brownish orange (6C4), grading outward to pale peachy orange (6A3), pinkish buff or orangish white (5A2–3) at the margin, with age sometimes washing out to nearly white. ***Context*** unobserved. ***Lamellae*** adnate, subdistant to distant with 3–4 series of lamellulae, weakly intervenose with age, narrow, convex to straight or concave, white. ***Stipe*** 1–3 × 0.5–1 mm, curved, lateral arising from the cleft, terete, cylindrical, equal, pruinose overall, white. ***Odour and taste*** indistinct. ***Basidiospores*** (7.2–)8–8.8(–9.6) × 4–4.8 µm (x_m = 8.32 ± 0.57 × 4.26 ± 0.38, Q = 1.67–2.20, Q_m = 1.97 ± 0.17, n = 25 spores per 1 specimen), ellipsoid, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** c. 17.6 × 6.4 µm, clavate, 4-spored. ***Basidioles*** fusoid to clavate. ***Cheilocystidia*** common, 13.6–24 × 4.8–8.8 µm, fusoid to clavate, subglobose or irregular in shap, thin-walled, hyaline, diverticulate; diverticula c. 5.6 × 1.6–3.2 µm, conical to clavate or irregular in shape, thin-walled. ***Pileipellis*** a cutis; hyphae 4–8.8 µm diam., smooth or weakly diverticulate, not incrusted, thin-walled, hyaline, inamyloid. ***Pileal trama*** interwoven; hyphae 1.6–4 µm diam., thin-walled, inamyloid. ***Stipe tissue*** monomitic; hyphae 3.2–8 µm diam., equal, weakly diverticulate, cylindrical, parallel, thin- to thick-walled (up to 1.6 µm), hyaline, inamyloid to weakly dextrinoid. ***Stipe vesture*** absent. ***Clamp connections*** present.

Distribution. Indonesia (Bali), Colombia (Valle, Buenaventura), Bolivia (Beni), Martinique, and Guadeloupe.

Habit and habitat. Densely gregarious on undetermined dicot branches.

Additional specimen examined. INDONESIA: **Bali Province:** Tabanan, Baturiti, Candikuning, Ekakarya Botanical Garden, trail to Mount Pohen, 17 Jan 1998, *Desjardin 6808* (BO).

Notes. *Marasmiellus inodermatoides*, described from Bolivia (Singer, 1973), is common in Colombia (Singer, 1973), Martinique and Guadeloupe (Pegler, 1983). The

Fig. 4. *Marasmiellus inodermatoides* Singer. From *D.E. Desjardin 6808*. (Photo: D.E. Desjardin)

New World specimens differ from the Indonesian specimen in having a stipe vesture, larger pileus (up to 33 mm diam), longer stipe (up to 10 mm), and slightly larger basidiospores (7.5–10 × 4.5–6.5 µm).

4. *Marasmiellus ignobilis* (Berk. & Broome) Singer, Beih. Nova Hedwigia 44: 264 (1973). – *Marasmius ignobilis* Berk. & Broome, J. Linn. Soc., Bot. 14: 40 (1873). – TYPE: Sri Lanka, Peradeniya, on wood, *Thwaites 68 B* (lectotype K, designated here). (Fig. 6, 7)

Pileus 5–12 mm diam., plano-convex in side view, flabelliform to semiorbicular in face view; margin wavy to irregular, decurved; surface rugulose, sometimes rugulo-

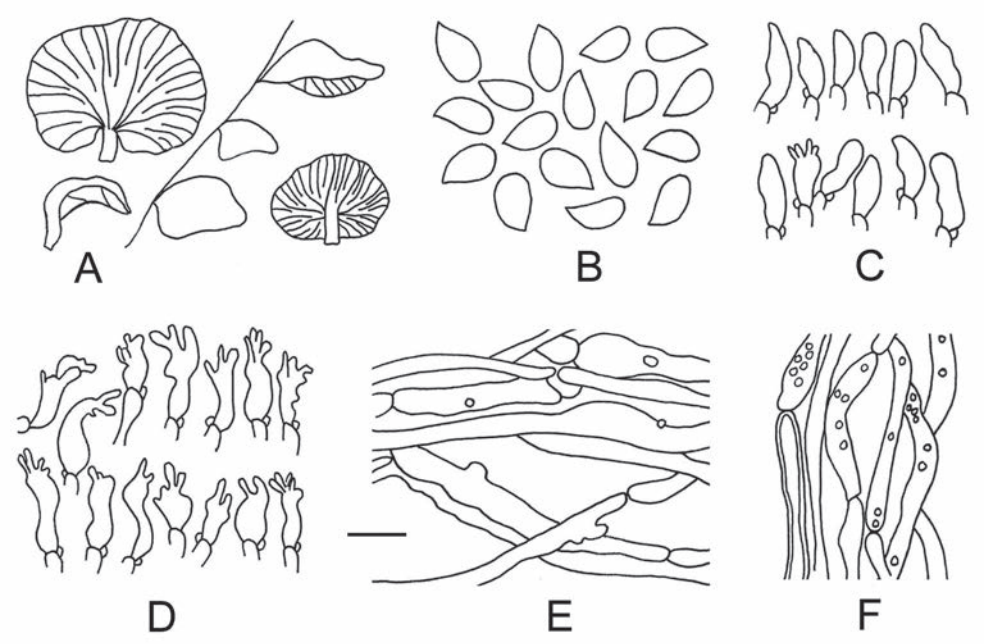

Fig. 5. *Marasmiellus inodermatoides* Singer. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidia and basidioles. **D.** Cheilocystidia. **E.** Pileipellis. **F.** Hyphae of stipe. Scale bar: B = 10 µm; C–F = 20 µm. Drawn by A. Retnowati from *D.E. Desjardin 6808*.

striatulate or with smooth margin, felted to suede-like, dull, dry, pale brownish orange (6C3) to pale brown pinkish orange (7C3). ***Context*** unobserved. ***Lamellae*** adnate, distant (4–6) with 3–4 series of lamellulae, wavy, intervenose with age, narrow, pale cream-buff. ***Stipe*** absent or only a small bulb at the edge of pileus. ***Odour*** strongly of garlic; ***taste*** indistinctive. ***Basidiospores*** 8–8.8(–9.6) × 3.2–4.8 µm (only 9 observed), ellipsoid, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** unobserved. ***Basidioles*** fusoid to clavate. ***Cheilocystidia*** common; main body 13.6–24 × 7.2–9.6 µm, fusoid, to clavate or irregular shaped, diverticulate, thin-walled, hyaline; diverticula 8–9.6 × 1.6–2.4 µm, clavate to cylindrical, or irregular shaped, thin-walled. ***Pleurocystidia*** absent. ***Pileipellis*** composed of a *Rameales*-structure; hyphae 2.4–4 µm diam., diverticulate, slightly incrusted, thin-walled, hyaline, inamyloid. ***Pileal trama*** interwoven; hyphae 3.2–4 µm diam., thin-walled, incrusted, inamyloid. ***Stipe tissue*** monomitic; hyphae 4.8–5.6 µm diam., hyaline to yellowish white, thick-walled (up to 0.8 µm), non-diverticulate. ***Stipe vesture*** common, similar to the pileipellis; caulocystidia 18.4–40.2 µm, fusoid or irregular shaped, thin-walled, hyaline, inamyloid; diverticula 1.8–9.2 µm, clavate or cylindrical, thin-walled. ***Clamp connections*** present.

Distribution. Indonesia (Java), Sri Lanka, Kenya, Tanzania, Uganda, and Mexico.

Habit and habitat. Gregarious on *Philodendron* Schott liana bark.

Fig. 6. *Marasmiellus ignobilis* (Berk. & Broome) Singer. From *D.E. Desjardin 7063*. (Photo: D.E. Desjardin)

Additional specimen examined. INDONESIA: **West Java Province:** Bogor Botanical Garden, 8 Jan 2000, *Desjardin 7063* (BO).

Notes. Marasmiellus ignobilis is recognised by having a strong odour of garlic. The species is widely distributed from East Africa (Kenya, Tanzania, and Uganda; Pegler, 1977) to the Neotropics (Mexico; Singer, 1973), South Asia (Sri Lanka; Pegler, 1986), and Indonesia. The garlic odour was not reported from East African material (Pegler, 1977). The Indonesian specimen is characterised by a very short stipe, which differs from other reports. Basidiocarps normally have a lateral, eccentric, or almost central stipe (Pegler, 1977). Others species of *Marasmiellus* with a garlic odour are *M. alliiodorus* (Bertero ex. Mont.) Singer (Singer, 1973), *M. subingratus* (Dennis) Singer (Pegler, 1983), and *M. osmophorus* Dennis (Singer, 1973). The last two species belong to *Marasmiellus* sect. *Rameales*.

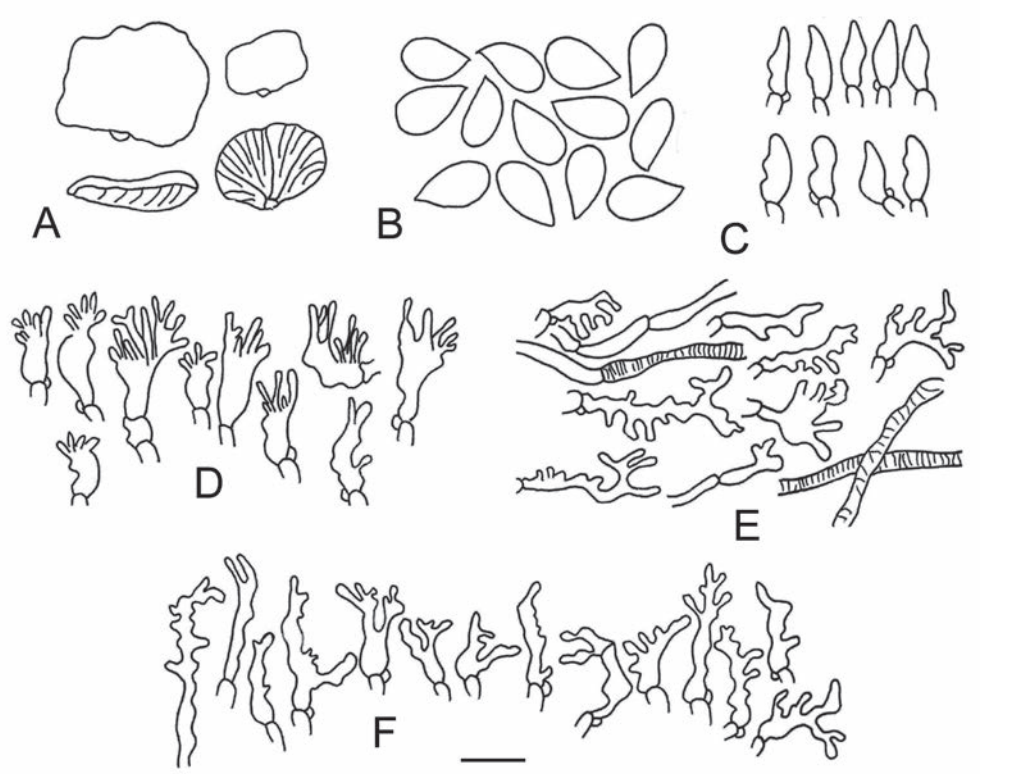

Fig. 7. *Marasmiellus ignobilis* (Berk. & Broome) Singer. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidioles. **D.** Cheilocystidia. **E.** Pileipellis. **F.** Caulocystidia. Scale bar: B = 10 µm; C–F = 20 µm. Drawn by A. Retnowati from *D.E. Desjardin 7063*.

Marasmiellus ignobilis has also been treated as *Mycetinis ignobilis* (Berk. & Broome) Desjardin & B.A.Perry based on molecular characters (Desjardin & Perry, 2017).

5. *Marasmiellus* aff. *concolor* (Berk. & M.A.Curtis) Singer, Sydowia 15: 57 (1961). – *Marasmius concolor* Berk. & M.A.Curtis, J. Linn. Soc., Bot. 10: 299 (1869). – TYPE: Cuba, on sticks in woods, December, *Wright 74* (holotype K). (Fig. 8, 9)

Pileus 10–15(–35) mm diam., sessile, cordate in face view, convex in side view, striate, glabrous, dull, dry; at first light yellow (4A4) to light orange (5A4), fading with age to white. ***Context*** unobserved. ***Lamellae*** adnexed to point of attachment, distant, with 3–4 series of lamellulae, convex, broad (1–3 mm), non-marginate, white. ***Stipe*** absent. ***Odour and taste*** indistinct. ***Basidiospores*** (9.6–)10.4–11.2(–12) × 5.6–6.4(–7.2) µm (x_m = 10.88 ± 0.61 × 6.19 ± 0.45, Q = 1.50–2.14, Q_m = 1.77 ± 0.17, n = 25 spores per 1 specimen), ellipsoid, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** 25.6–29.4 ×

Fig. 8. *Marasmiellus* aff. *concolor* (Berk. & M.A.Curtis) Singer. From *D.E. Desjardin 6730*. (Photo: D.E. Desjardin)

7.2–10.4 µm, clavate, 4-spored. ***Basidioles*** fusoid to clavate. ***Cheilocystidia*** composed of *Siccus*-type cells; main body 12–24 × 5.6–8.8 µm, fusoid to clavate, or subglobose, thin-walled, hyaline; setulae 1.6–4.8 × 0.8–1.6 µm, conical, some with pointed apex or some not, thin-walled, hyaline. ***Pleurocystidia*** absent. ***Pileipellis*** a *Rameales*-structure; hyphae 3.2–4 µm diam., diverticulate, not incrusted to very weakly incrusted, thin-walled, hyaline, inamyloid; diverticula 3.2–5.6 × 2.4–3.2 µm, conical to clavate or irregular in shape, thin-walled, hyaline. ***Pileal trama*** interwoven; hyphae 2.4–5.6 µm diam., thin-walled, hyaline, inamyloid. ***Clamp connections*** present.

Distribution. Indonesia (Java) and Cuba.

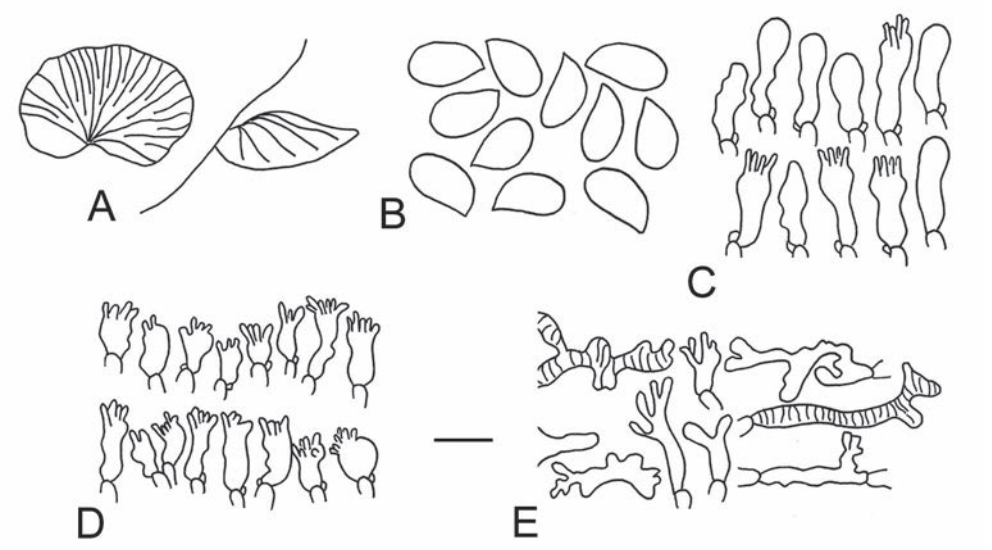

Fig. 9. *Marasmiellus* aff. *concolor* (Berk. & M.A.Curtis) Singer. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidia and basidioles. **D.** Cheilocystidia. **E.** Pileipellis. Scale bar: B = 10 µm; C–E = 20 µm. Drawn by A. Retnowati from *D.E. Desjardin 6730.*

Habit and habitat. Gregarious on sticks of undetermined dicot in *Castanopsis javanica* A.DC. forest.

Additional specimen examined. INDONESIA: **West Java Province:** Cibodas Botanical Garden, trail to Mount Gede, 9 Jan 1998, *Desjardin 6730* (BO).

Notes. This species is nearly indistinguishable from *Marasmiellus concolor*, described from Cuba, but the latter forms smaller basidiocarps and basidiospores (5–7 × 2.5–3.3 µm; Singer, 1973).

6. *Marasmiellus epochnous* (Berk. & M.A.Curtis) Singer, Sydowia 15: 57 (1961). – *Marasmius epochnous* Berk. & M.A.Curtis, J. Linn. Soc., Bot. 14: 41 (1873). – TYPE: Sri Lanka, on dead sticks, south of the island, July 1868, *Thwaites 683* (lectotype K, designated here). (Fig. 10, 11)

Pileus <1–5 mm diam., reniform, convex; surface dry, dull, smooth, powdery, suede-like; margin straight, ero ded, torn, especially with age, beige coloured, sometimes margin lighter than disc. ***Context*** thin, same colour as cap. ***Lamellae*** free to adnate, close with 1–2 series of lamellulae, narrow, forked, anastomosing, near stipe subporoid, beige. ***Stipe*** <1–2 × 0.5–1 mm, lateral, much reduced, terete, curved, equal, solid, dull, dry, insititious, beige. ***Odour and taste*** indistinct. ***Basidiospores*** 8–8.8(–9.6) × 4–4.8 µm (x_m = 8.58 ± 0.54 × 4.45 ± 0.41, Q = 1.67–2.20, Q_m = 1.94 ± 0.19, n = 25 spores

Fig. 10. *Marasmiellus epochnous* (Berk. & M.A.Curtis) Singer. From *D.E. Desjardin 6904*. (Photo: D.E. Desjardin)

per 3 specimens), ellipsoid, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** 20–26.4 × 6.4–7.2 µm, clavate, 4-spored. ***Basidioles*** fusoid to clavate. ***Cheilocystidia*** common, composed of *Siccus*-type broom cells; main body 12–24 × 5.6–11.2 µm, cylindrical to clavate, broadly clavate, or irregular in shape, thin-walled, hyaline; setulae 1.6–11.2 × 2.4–5.6 µm, conical to cylindrical, clavate, or irregular in shape, obtuse, thin-walled, hyaline. ***Pleurocystidia*** absent. ***Pileipellis*** composed of a *Rameales*-structure; hyphae 3.2–6.4 µm diam., some incrusted, thin- to thick-walled (up to 0.8 µm), with irregular hyphae tips, inamyloid. ***Pileal trama*** interwoven; hyphae 3.2–6.4 µm diam., hyaline, thick-walled, inamyloid. ***Stipe tissue*** monomitic; hyphae 1.16–9.6 µm diam., parallel, cylindrical, equal, thick-walled (up to 2.4 µm), inamyloid. ***Stipe vesture*** common; caulocystidia 4–40 × 3.2–10.4 µm, fusoid to clavate or irregular in shape, thin- to thick-walled (up to 0.8 µm), inamyloid. ***Clamp connections*** present.

Distribution. Indonesia (Java), Cuba, Brazil and Sri Lanka.

Habit and habitat. Scattered to gregarious on undetermined dicot and fallen twigs.

Additional specimens examined. INDONESIA: **West Java Province:** Sukabumi, Parung Kuda, Halimun National Park, Cikaniki trail, 13 Jan 1998, *Collins 98–24* (SFSU); Sukabumi, Parung Kuda, Halimun National Park, loop trail Perth Zoo, 7 Jan 1999, *KPC-6* (BO); Sukabumi, Parung Kuda, Halimun National Park, loop trail from Cikaniki, c. 1000 m asl, 9 Jan 1999, *Desjardin 6904* (BO).

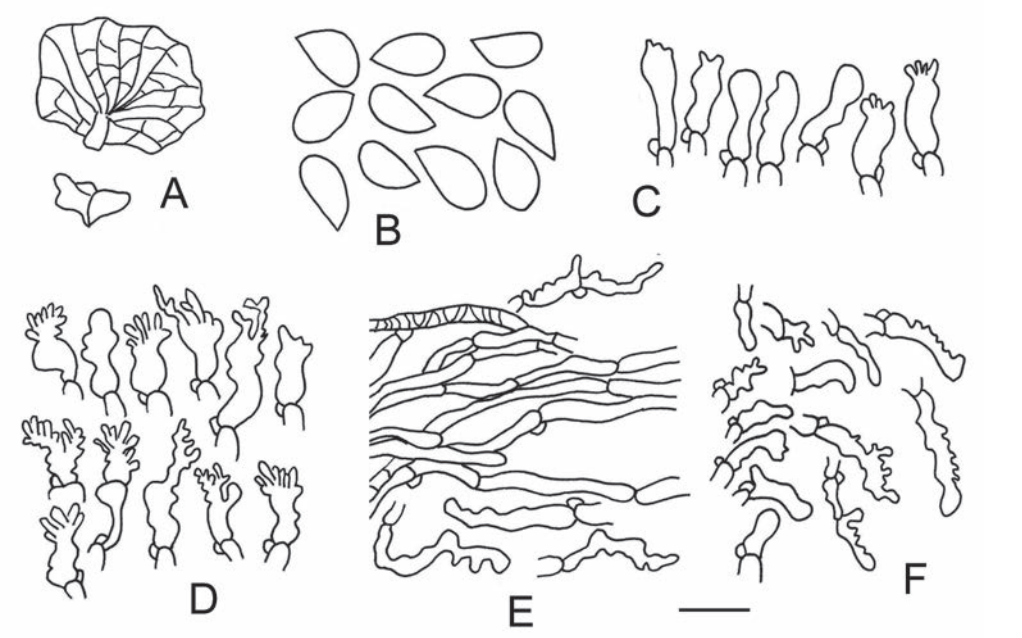

Fig. 11. *Marasmiellus epochnous* (Berk. & M.A.Curtis) Singer. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidia and basidioles. **D.** Cheilocystidia. **E.** Pileipellis. **F.** Caulocystidia. Scale bar: B = 10 µm; C–F = 20 µm. Drawn by A. Retnowati from *K.P. Collins 98–24*.

Notes. *Marasmiellus epochnous* was first reported from Indonesia by Singer (1973), who mentioned that one of the specimens he examined was collected by Zollinger from Java. The species is similar to *Marasmiellus ignobilis* (Berk. & Broome) Singer (Pegler, 1977) and *M. inconspicuus* Murrill (Pegler, 1983). The former species was described from Sri Lanka (Pegler, 1977) and it differs from *M. epochnous* in having a strong garlic odour and the absence of a stipe vesture. *Marasmiellus inconspicuus* differs from *M. epochnous* in having lamellae that are not intervenose nor anastomosed, and more acute setulae on cheilocystidia (Pegler, 1983).

7. *Marasmiellus zingibericola* Retn., **sp. nov.** – TYPE: Indonesia, Java, Banten Province, Banten, Serang, Ujung Kulon National Park, Mount Honje northern part, via Cilimus, on dicot leaves, 15 June 2008, *A. Retnowati 597* (holotype BO). Mycobank: MB 821678. (Fig. 12)

Pileus 3–39 mm diam., circular to convex, sometimes broadly convex, sulcate to striate, strongly hygrophanous; margin incurved to wavy; surface smooth to slightly wrinkled, glabrous, off-white. ***Context*** thick, off-white (concolorous with pileus). ***Lamellae*** adnate to adnexed, subdistant, with 2–3 series of lamellulae, narrow to moderately broad, white to off-white. ***Stipe*** 2–15 × 1–4 mm, eccentric, cylindrical,

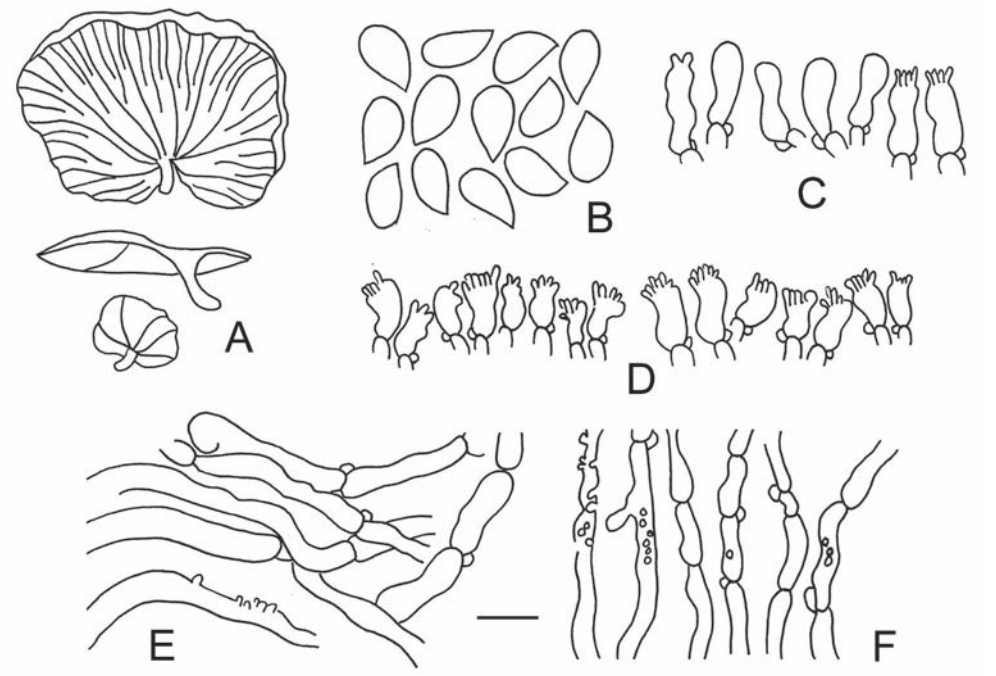

Fig. 12. *Marasmiellus zingibericola* Retn. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidia and basidioles. **D.** Cheilocystidia. **E.** Pileipellis. **F.** Hyphae of stipe Scale bar: B = 10 µm; C–F = 20 µm. Drawn by A. Retnowati from *A. Retnowati 597.*

hollow to solid, smooth to slightly venose, glabrous, non-insititious; off-white, with white base tomentum. ***Odour and taste*** indistinct. ***Basidiospores*** 8–12.8(–13.6) × 4–7.2 µm (x_m = 9.94 ± 1.5 × 5.20 ± 0.8, Q = 1.4–2.8, Q_m = 1.92 ± 0.2, n = 25 spores per 5 specimens), ellipsoid, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** 16.8–32 × 5.6–8 µm, clavate, 4-spored. ***Basidioles*** clavate. ***Cheilocystidia*** common, composed of *Siccus*-type broom cells; main body 9.6–23 × 4.8–11.2 µm, clavate to broadly clavate, thin-walled, hyaline; diverticula 0.8–6.4 × 0.8–1.6 µm, conic to clavate or irregular in shape. ***Pleurocystidia*** absent. ***Pileipellis*** composed of weak *Rameales*-structure, with or without diverticula, some incrusted; hyphae 3.2–8.8 µm diam., thin-walled, hyaline, inamyloid. ***Pileal trama*** interwoven; hyphae 4–12 µm diam., thin-walled, hyaline. ***Stipe tissue*** monomitic; hyphae 2.4–10.4 µm diam., parallel, cylindrical, thin-walled, inamyloid to very weakly dextrinoid, diverticulate, hyaline to yellowish brown. ***Stipe vesture*** absent. ***Clamp connections*** present.

Distribution. Indonesia (Java).

Habit and habitat. Solitary to gregarious on dicot leaves, twig or wood, and on rotten *Zingiber* Mill. leaves.

Etymology. The epithet *zingibericola* refers to the observation of this species growing on the leaves of *Zingiber* spp.

Additional specimens examined. INDONESIA: **Banten Province:** Banten, Serang, Ujung Kulon, Mount Honje, East-South part, via Cibiuk, 14 Jun 2008, *Retnowati 595* (BO); ibid., 15 Jun 2008, *Retnowati 599* (BO), *A. Retnowati 604* (BO); ibid., 17 Jun 2008, *Retnowati 626* (BO).

Notes. The species is characterised by circular to convex, sometimes broadly convex and strongly hygrophanous pileus, adnate to adnexed, subdistant lamellae with 2–3 series of lamellulae, and common cheilocystidia. This species is similar to *Marasmiellus troyanus* (Murrill) Dennis (Pegler, 1983) and *M. semiustus* (Berk. & Broome) Singer (Pegler, 1983), but they both grow on different monocotyledonous hosts. The first species grows on palm, and the latter species grows on banana leaves. The Indonesian species grows on rotten *Zingiber* leaves and on dicotyledonous twigs and wood.

8. *Marasmiellus rifaii* Retn., **sp. nov.** – TYPE: Indonesia, Java, East Java Province, Surabaya, Darmo street, on living trunk of *Lagerstroemia indica*, 7 March 2008, *Mien A. Rifai s.n.* (holotype BO). Mycobank: MB 821679. (Fig. 13)

Pileus 4–10 mm diam., convex with flattened disc, strongly hygrophanous; margin straight to slightly incurved with age; surface dry, dull, glabrous; white to dirty white, slightly darker below to brownish white. ***Context*** unobserved. ***Lamellae*** adnate, distant, with 1–2 series of lamellulae, moderately broad, white to dirty white. ***Stipe*** 3–5 × 1–2 mm, eccentric, cylindrical or slightly tapered at the base, insititious, dull, dry, glabrous, white to dirty white. ***Odour and taste*** not observed. ***Basidiospores*** 12–15.2 × 5.6–6.4 µm (x_m = 13.57 ± 0.97 × 6.30 ± 0.27, Q = 1.88–2.57, Q_m = 2.15 ± 0.16, n = 25 spores per 2 specimen), fusoid, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** c. 32 × 6.4 µm, clavate, 4-spored. ***Basidioles*** clavate. ***Cheilocystidia*** absent. ***Pleurocystidia*** absent. ***Pileipellis*** composed of a *Rameales*-structure; hyphae 5.6–9.6 µm diam., thin- to thick-walled (up to 0.8 µm), inamyloid. ***Pileal trama*** interwoven; hyphae 4.8–13 µm diam., thick-walled (up to 2.4 µm), hyaline. ***Stipe tissue*** monomitic; hyphae 3.2–6.4 µm diam., cylindrical, parallel, thin- to thick-walled (up to 2.4 µm), diverticulate, inamyloid, hyaline. ***Stipe vesture*** absent. ***Clamp connections*** present.

Distribution. Indonesia (Java).

Habit and habitat. Gregarious to caespitose on living trunk of *Lagerstroemia indica* L.

Etymology. The epithet *rifaii* is in honour of Prof. Mien A. Rifai who has contributed much to the development of mycology in Indonesia.

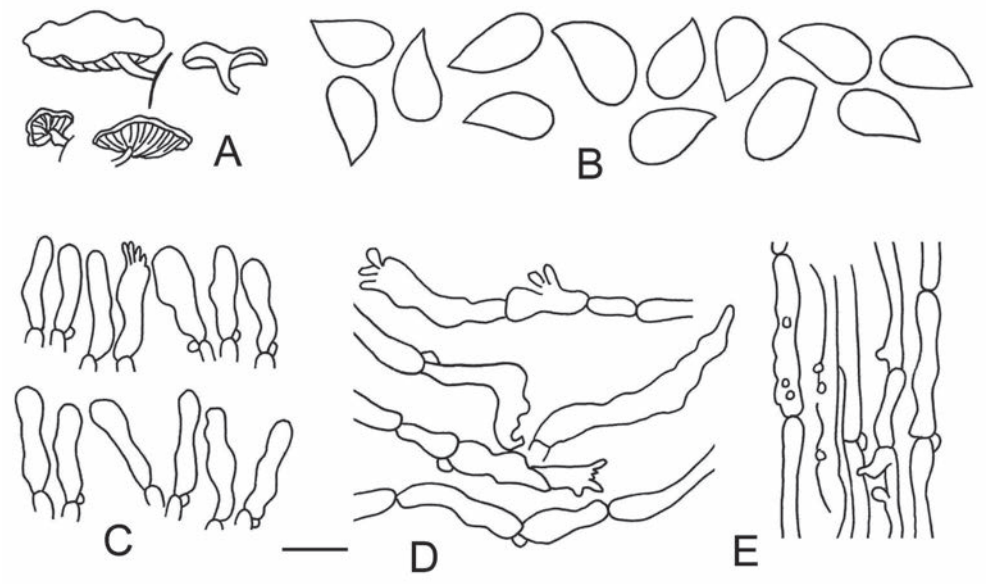

Fig. 13. *Marasmiellus rifaii* Retn. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidia and basidioles. **D.** Pileipellis. **E.** Hyphae of stipe. Scale bar: B = 10 µm; C–E = 20 µm. Drawn by A. Retnowati from *Mien A. Rifai s.n.*

Additional specimen examined. INDONESIA: **East Java Province:** Surabaya, Darmo street, 14 Apr 2011, *Mien A. Rifai s.n.* (BO).

Notes. This species is characterised by an eccentric stipe, large basidiospores with a mean of 13.6 × 6.3 µm, and a host specificity on living bark of *Lagerstroemia indica*. The species is similar to *Marasmiellus sanctaemarthae* Singer from Colombia, which has larger fusoid-ventricose basidiospores (9–18 × 4.3–7 µm), forms abundant cheilocystidia, and grows on bark of dicotyledonous trees including *Eugenia confusa* DC. (Singer, 1973).

9. *Marasmiellus nugatorius* (Corner) Retn., **comb. nov.** – *Marasmius nugatorius* Corner, Beih. Nova Hedwigia 111: 80 (1996). – TYPE: Singapore, Bukit Timah, 28 July 1940, on dead leaves of trees in forest, *Corner s.n.* (type untraced). Mycobank: MB 821725. (Fig. 14)

Pileus 3–8 mm diam., plano-convex or convex in side view, semiorbicular in surface view, margin often cleft to stipe; dull, dry, glabrous, even (not striate) to striatulate; white. ***Context*** unobserved. ***Lamellae*** shallowly adnate, distant with 1 series of lamellulae, narrow, white, non-marginate. ***Stipe*** 1–2 × 0.5 mm, eccentric to nearly lateral, terete, curved, solid, pruinose, insititious, white. ***Odour and taste*** indistinct. ***Basidiospores*** 7.2–8.8(–10.4) × 3.2–4.8 µm (only 15 spores observed), ellipsoid,

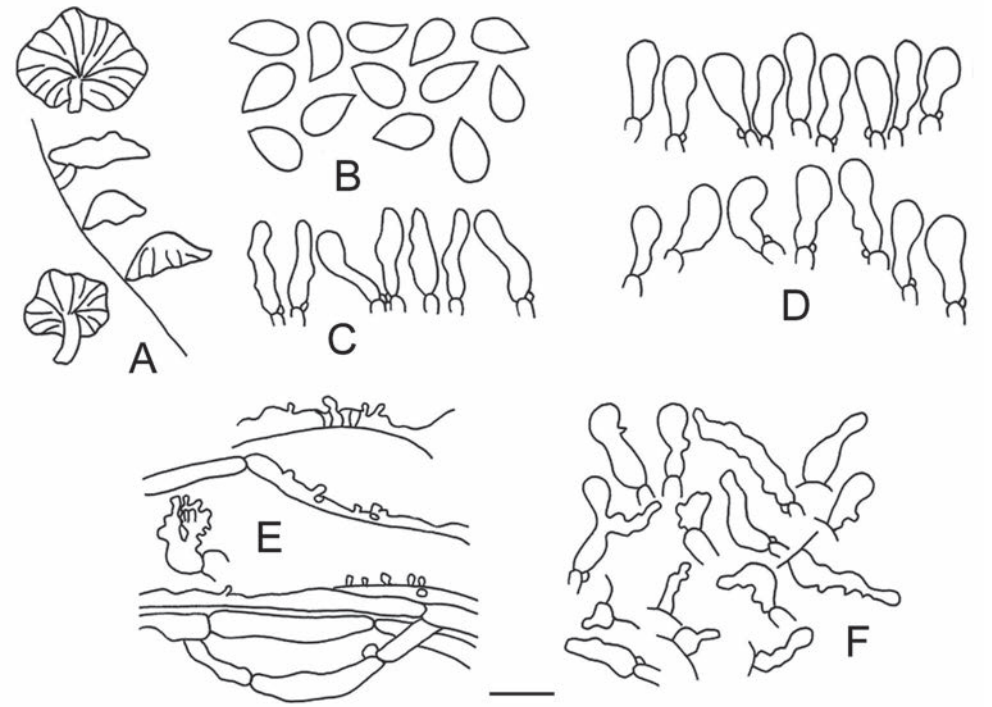

Fig. 14. *Marasmiellus nugatorius* (Corner) Retn. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidioles. **D.** Hymenial cystidia. **E.** Pileipellis. **F.** Caulocystidia. Scale bar: B = 10 µm; C–F = 20 µm. Drawn by A. Retnowati from *D.E. Desjardin 7100*.

smooth, hyaline, inamyloid, thin-walled. ***Basidia*** unobserved. ***Basidioles*** 24–29.6 × 4–5.6 µm, clavate. ***Hymenial cystidia*** common; main body 18.4–25.6 × 8–11.2 µm, clavate to subglobose, smooth, non-diverticulate, thin-walled, hyaline. ***Pileipellis*** composed of a weak *Rameales*-structure; hyphae 4–12 µm diam., diverticulate, incrusted, thin-walled, hyaline, inamyloid. ***Pileus trama*** interwoven; hyphae 2.4–12 µm diam., incrusted, thin-walled, inamyloid. ***Stipe tissue*** monomitic; hyphae 1.6–4.6 µm diam., some slightly incrusted, thin-walled, hyaline, inamyloid. ***Stipe vesture*** common; caulocystidia 11.2–48 × 4–10.4 µm, fusoid to clavate, subglobose or irregular in shape, with or without diverticula, thin-walled, hyaline, inamyloid. ***Clamp connections*** present.

Distribution. Indonesia (Java) and Singapore (Bukit Timah).

Habit and habitat. Gregarious on assorted dicot twigs in montane rain forest.

Additional specimen examined. INDONESIA: **West Java Province:** Cibodas Botanical Garden, c. 1550 m asl, 10 Jan 2000, *Desjardin 7100* (BO, SFSU).

Notes. Marasmius nugatorius, described by Corner (1996) based on a specimen collected from Bukit Timah, Singapore, is herein treated as belonging to the genus *Marasmiellus* sect. *Rameales*, because of the presence of a *Rameales*-type pileipellis with densely diverticulate hyphae and terminal cells.

10. *Marasmiellus pangerangensis* (Henn.) Retn., **comb. nov.** – *Marasmius pangerangensis* Henn., Monsunia 1: 150 (1900). – TYPE: Indonesia, West Java Province, Pangerango forest, on dead branches, 18 July 1898, *M. Fleischer s.n.* (not extant). Mycobank: MB 821726. (Fig. 15, 16)

Pileus 4–15 mm diam., hemispherical to asymmetrically convex or plano-convex, expanding with age, becoming ear-shaped or dimidiate, membranaceous, tough, rugulose-sulcate to rugulo-striate; margin decurved, entire; surface irregularly grooved or venose, suede-like, dull, dry, opaque; cream to off-white, or pure white overall, often with apricot tinge. ***Context*** unobserved. ***Lamellae*** shallowly adnate to adnate, distant (4–7), with 2–3 series of lamellulae, forked, anastomosing, intervenose, narrow to moderately broad, cream to off-white or white; edges even, concolorous. ***Stipe*** 1–3 × 0.5–1 mm, strongly eccentric to nearly lateral, cylindrical, base often slightly swollen, curved, equal, terete, solid, dry, insititious, minutely pruinose, base with inconspicuous fibrils or scurfy, white. ***Odour and taste*** indistinct. ***Basidiospores*** (8.8–)9.6–11.2(–13.4) × (5.6–)6.4–7.2(–8) µm (x_{mr} = 10–10.8 × 6.4–7, x_{mm} = 10.42 ± 0.4 × 6.72 ± 0.3, Q = 1.3–1.9, Q_{mr} = 1.50–1.64, Q_{mm} = 1.56 ± 0.1, n = 25 spores per 4 specimens), ellipsoid, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** 35.2–42.4 × 7.2–9.6 µm, clavate, 4-spored. ***Basidioles*** fusoid to clavate or broadly clavate. ***Cheilocystidia*** absent. ***Pleurocystidia*** absent. ***Pileipellis*** a cutis; hyphae 3.2–8 µm diam., with or without diverticula, slightly incrusted, thick-walled (up to 3.2 µm), hyaline to yellowish brown, inamyloid. ***Pileal trama*** interwoven; hyphae 3.2–4 µm diam., thick-walled (up to 1.6 µm), yellowish brown, inamyloid. ***Stipe tissue*** monomitic; hyphae 2.4–7.2 µm diam., thin- to thick-walled (up to 2.4 µm), hyaline, diverticula up to 7.2 µm long, incrusted, inamyloid. ***Stipe vesture*** uncommon; caulocystidia 12–32 × 4–5.6 µm, clavate to cylindrical, thin-walled. ***Clamp connections*** present.

Distribution. Indonesia (Java and Bali).

Habit and habitat. Solitary in groups or gregarious on rotting bark of undetermined dicot sticks in deciduous forest dominated by *Castanopsis* D.Don (Spach) – *Quercus* L., c. 950 m asl, or imbricate on rotten dicot twigs.

Additional specimens examined. INDONESIA: **West Java Province:** Sukabumi, Parung Kuda, Mount Halimun National Park, Cikaniki Research Station, loop trail, 13 Jan 1998, *ZT 7052* (BO); Cibodas Botanical Garden, 11 Jan 1999, *Desjardin 6913* (BO); Sukabumi, Parung Kuda, Mount Halimun-Salak National Park, Ecology Plot, trail to Pameungpeuk, c. 1200–1240 m asl, 8 May 2010, *Retnowati 748* (BO). **Bali Province:** Tabanan, Baturiti, Candikuning, Eka Karya Botanical Garden, trail to Mount Pohen, c. 1500 m asl, 14 Jan 1999, *Desjardin 6932* (BO).

Fig. 15. *Marasmiellus pangerangensis* (Henn.) Retn. From *D.E. Desjardin 6913*. (Photo: D.E. Desjardin)

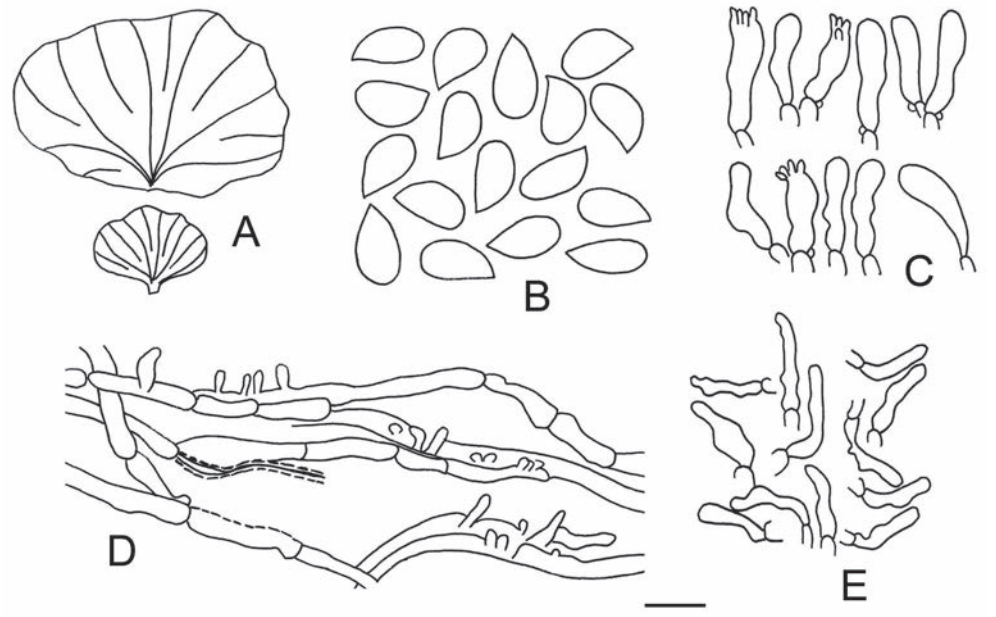

Fig. 16. *Marasmiellus pangerangensis* (Henn.) Retn. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidia and basidioles. **D.** Pileipellis. **E.** Caulocystidia. Scale bar: B = 10 µm; C–E = 20 µm. Drawn by A. Retnowati from *A. Retnowati 748*.

Notes. Marasmius pangerangensis was originally described from Mount Pangerango based on material collected by Fleischer in July 1898. As noted by Desjardin et al. (2000), a whitish (pallescent), flabelliform, rugulose-sulcate pileus, venose-anastomosing lamellae, and a short, eccentric, pale, subvelutinous stipe indicate the species belongs in *Marasmiellus*, and is transferred herein. New material matching the protologue was collected from several different locations, and the cutis-type pileipellis and non-dextrinoid tissues of this material indicate a proper placement in *Marasmiellus*. The species is similar to *Marasmiellus inodermatoides*, but the latter differs in forming larger basidiocarps (pileus up to 25 mm diam), smaller basidiospores (8–8.8(–9.6) × 4–4.8 µm) and has conspicuous cheilocystidia.

11. *Marasmiellus reniformis* Retn., **sp. nov.** – TYPE: Indonesia, Bali Province, Eka Karya Botanical Garden, trail to Mount Pohen, primary forest area, on decaying wood, 16 January 1998, *K.P. Collins 98–37* (holotype BO). Mycobank: MB 821680. (Fig. 17, 18)

Pileus 3–20 mm diam., convex to plano-convex, hemispherical, or reniform in side/face view, rounded to cordate in top view, with a cleft where stipe attaches, dull, dry,

Fig. 17. *Marasmiellus reniformis* Retn. From *D.E. Desjardin 6807*. (Photo: D.E. Desjardin)

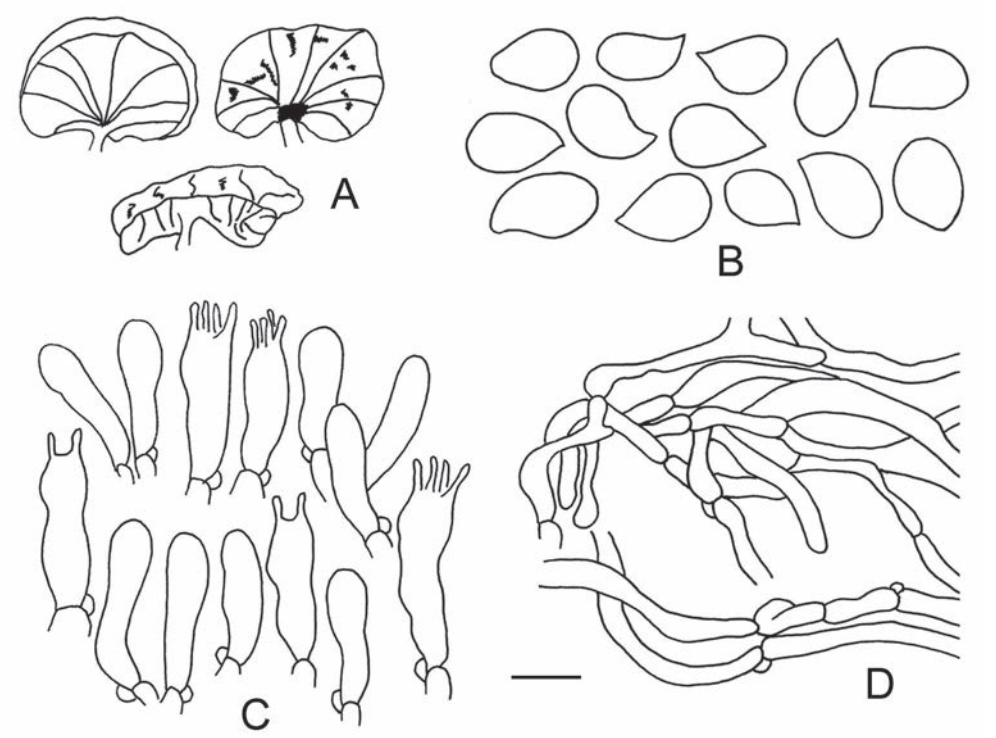

Fig. 18. *Marasmiellus reniformis* Retn. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidia and basidioles. **D.** Pileipellis. Scale bar: B = 10 µm; C–E = 20 µm. Drawn by A. Retnowati from *K.P. Collins 98–37*.

rugulo-striate to rugulo-ridged or plicate, smooth to wrinkled, suede-like; margin straight; pure white to buff, sometimes staining bright yellow with age. ***Context*** unobserved. ***Lamellae*** adnate, distant to remote (7–9), with 3–5 series of lamellulae; forked and anastomosing, intervenose, often strongly so, narrow to medium broad; edge smooth, white with a pinkish tint. ***Stipe*** lateral to strongly eccentric, 2–3 × 1 mm, terete, cylindrical, equal, subinsititious, glabrous to appressed-suede-like, white overall with basal tomentum. ***Odour and taste*** indistinct. ***Basidiospores*** (8–)8.8–9.6(–10.4) × 5.6–7.2(–8) µm (x_{mr} = 9.3–9.8 × 6.6-6.8, x_{mm} = 9.52 ± 0.3 × 6.7 ± 0.1, Q = 1.2–1.8, Q_{mr} = 1.38–1.49, Q_{mm} = 1.43 ± 0.1, n = 25 spores per 2 specimens), broadly ellipsoid to ovoid, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** 28–36 × 8–9.6 µm, clavate, 4-spored. ***Basidioles*** clavate. ***Cheilocystidia*** absent. ***Pleurocystidia*** absent. ***Pileipellis*** a cutis; hyphae 3.2–5.6 µm diam., radially arranged, cylindrical, inamyloid, hyaline, thin- to thick-walled (up to 0.8 µm). ***Pileal trama*** interwoven; hyphae 3.2–6.4 µm diam., inamyloid, hyaline, thick-walled (up to 0.8 µm). ***Stipe tissue*** monomitic; hyphae 2.4–5.6 µm diam., parallel, cylindrical, hyaline, inamyloid, thick-walled (up to 1.6 µm). ***Stipe vesture*** absent. ***Clamp connections*** present.

Distribution. Indonesia (Bali).

Habit and habitat. Densely gregarious on dead branch of undetermined dicot.

Etymology. The epithet *reniformis* refers to the shape of the pileus.

Additional specimens examined. INDONESIA: **Bali Province:** Tabanan, Baturiti, Candikuning, Eka Karya Botanical Garden, trail to Mount Pohen, primary forest area, 17 Jan 1998, *Desjardin 6807* (BO).

Notes. This new species is characterised by having white pilei that sometimes stain bright yellow with age, forked to intervenose, white to pinkish white lamellae, a lateral or eccentric stipe, broadly ellipsoid to ovoid basidiospores with a mean of 9.5 × 6.7 µm, and no cheilocystidia or caulocystidia.

12. *Marasmiellus haurbentesis* Retn., **sp. nov.** – TYPE: Indonesia, West Java Province, Jasinga, Artificial *Dipterocarpaceae* forest "Haurbentes", Forestry Department, on dicot wood, 4 June 2009, *A. Retnowati 649* (holotype BO). Mycobank: MB 821713. (Fig. 19)

Pileus 7–23 mm diam., convex with depressed centre, slightly hygrophanous, margin wavy, sulcate, smooth, glabrous, white. **Context** thin, white. ***Lamellae*** adnate, subdistant with 2 series of lamellulae, broad, white. **Stipe** 4–7 × 1 mm, eccentric, solid, cylindrical with a bulbous base, non-insititious, smooth, pruinose to glabrous, white. **Odour and taste** indistinct. ***Basidiospores*** 8.8–11.2 × (4–)4.8–5.6 µm (x_m = 9.95 ± 0.70 × 4.96 ± 0.40, Q = 1.57–2.40, Q_m = 2.02 ± 0.19, n = 25 spores per 1 specimen), ellipsoid, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** 24–26.4 × 8.4 µm, clavate, 4-spored. ***Basidioles*** fusoid to clavate. ***Cheilocystidia*** common, composed of *Siccus*-type broom cells; main body 9.6–19.2 × 7.2–10.4 µm, clavate to broadly clavate, thin-walled, hyaline; diverticula 1.6 × 0.8–1.6 µm, conical, obtuse, thin-walled, hyaline. ***Pleurocystidia*** absent. ***Pileipellis*** a cutis; hyphae 4.8–6.4 µm diam., non-diverticulate, thin-walled, hyaline, inamyloid. ***Pileal trama*** interwoven; hyphae 3.2–7.2 µm diam., thin-walled, hyaline, inamyloid. ***Stipe tissue*** monomitic; hyphae 2.4–10.4 µm diam., cylindrical, some inflated, parallel, thick-walled (up to 1.6 µm), inamyloid. ***Stipe vesture*** absent. ***Clamp connections*** present.

Distribution. Indonesia (Java).

Habit and habitat. Scattered to gregarious on dicot wood.

Etymology. The epithet of *haurbentesis* is inspired by the locality where the species was collected.

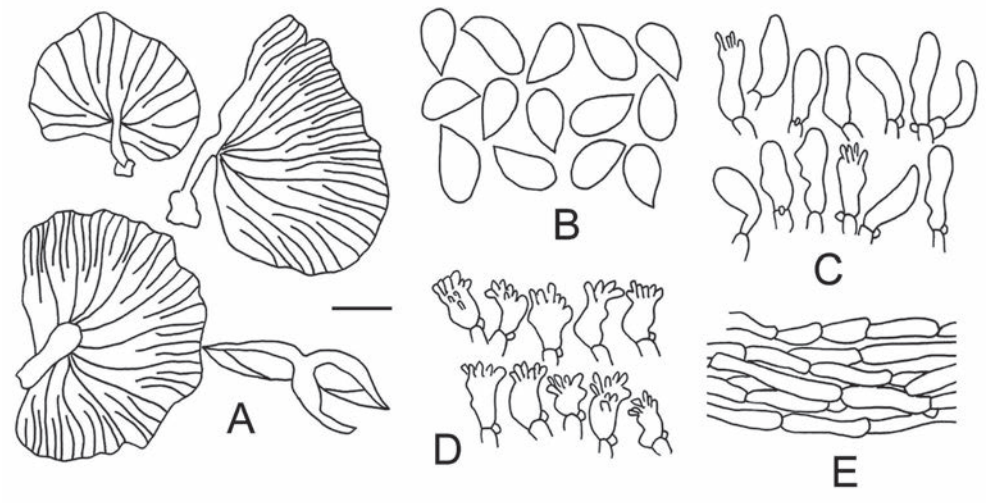

Fig. 19. *Marasmiellus haurbentesis* Retn. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidia and basidioles. **D.** Cheilocystidia. **E.** Pileipellis. Scale bar: B = 10 µm; C–E = 20 µm. Drawn by A. Retnowati from *A. Retnowati 649*.

Notes. This new species is characterised by a relatively small pileus (7–23 mm diam), subdistant lamellae with 2 series of lamellulae, eccentric stipe, ellipsoid basidiospores, *Siccus*-type cheilocystidia, and a cutis-type of pileipellis with non-diverticulate hyphae. Many species of *Marasmiellus* have similar features, but the most similar species to *M. haurbentesis* is *M. troyanus* (Singer, 1973), which differs by having caulocystidia and growing on monocotyledons.

13. *Marasmiellus longisiccus* Retn., **sp. nov.** – TYPE: Indonesia, Bali Province, Bedugul, south ridge of Mount Catur, East of Lake Beratan, 1200–1800 m asl, on a liana in primary forest, 17 January 1999, *D.E. Desjardin 6953* (holotype BO; isotype SFSU). Mycobank: MB 821714. (Fig. 20, 21)

Pileus 3–8 mm diam., obtusely conical in face view, round to oval in top view, rugulose overall, not striate, suede-like to minutely felted or appressed-silky, dull, dry, opaque, white when young, yellowish white (4A2) to orangish white (5A2) with age. ***Context*** membranous but delicate. ***Lamellae*** adnexed to central point of attachment, close to subdistant, with 1–2 series of lamellulae, medium broad, convex, white, discoloring like pileus. ***Stipe*** absent; pileus attached at centre of disc. ***Odour and taste*** indistinct. ***Basidiospores*** 8–8.8(–9.6) × (4.8–)5.6–6.4(–7.2) µm (x_{mr} = 8.6–8.9 × 5.8–6, x_{mm} = 8.74 ± 0.18 × 5.87 ± 0.11, Q = 1.2–1.7, Q_{mr} = 1.49, Q_{mm} = 1.49 ± 0, n = 25 spores per 3 specimens), ovoid to broadly ellipsoid, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** 20–26.4 × 5.6–7.2 µm, clavate, 4-spored. ***Basidioles*** clavate. ***Cheilocystidia*** common, composed of *Siccus*-type broom cells with 2–3 long setulae; main body 28–

Fig. 20. *Marasmiellus longisiccus* Retn. From *D.E. Desjardin 6953*. (Photo: D.E. Desjardin)

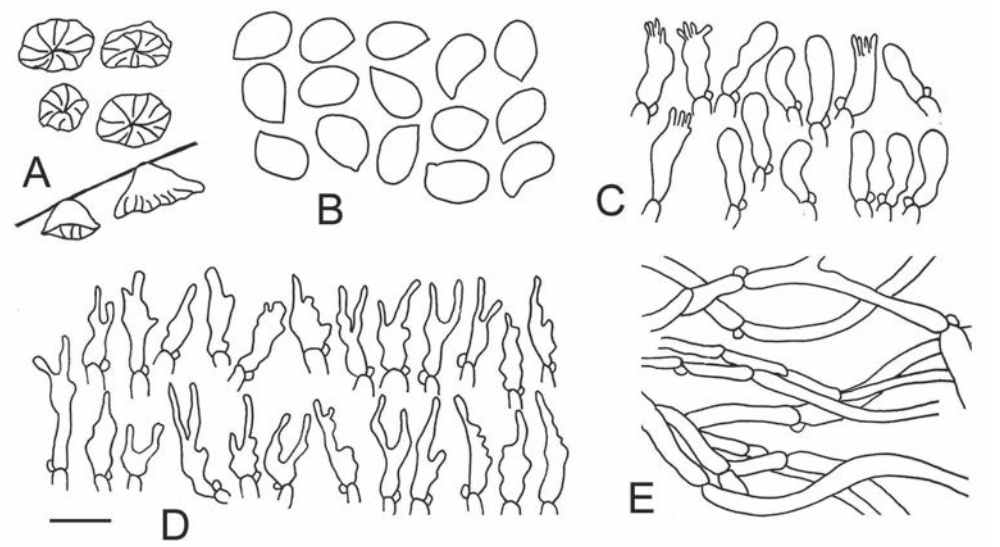

Fig. 21. *Marasmiellus longisiccus* Retn. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidia and basidioles. **D.** Cheilocystidia. **E.** Pileipellis. Scale bar: B = 10 µm; C–E = 20 µm. Drawn by A. Retnowati from *D.E. Desjardin 6953.*

34.4 × 8–9.6 µm, clavate to irregular in shape, thin-walled, hyaline; setulae 6.4–17.6 × 2.4–3.2 µm, conical to clavate, fusoid, or irregular in shape, thin-walled, hyaline. ***Pleurocystidia*** absent. ***Pileipellis*** a cutis; hyphae 2.4–9.6 µm diam., non-diverticulate, thin-walled, hyaline, not incrusted, inamyloid to very weakly dextrinoid. ***Pileal trama*** interwoven; hyphae 1.2–7.2 µm diam., thin-walled, hyaline, inamyloid. ***Clamp connections*** present.

Distribution. Indonesia (Bali).

Habit and habitat. Densely gregarious on a liana in primary forest and on undetermined dicot twigs.

Etymology. The epithet *longisiccus* refers to the presence of long setulae on the *Siccus*-type cheilocystidia.

Additional specimens examined. INDONESIA: **Bali Province:** south ridge of Mount Catur, Lake Beratan, trail to Mount Catur, c. 1300–1500 m asl, 21 Jan 2001, *Desjardin 7291* (BO).

Notes. The species is characterised by sessile, yellowish white pilei, a cutis-type pileipellis of non-diverticulate hyphae, and cheilocystidia with 2–3 apical setulae up to 17.6 µm long. No other known *Marasmiellus* species have cheilocystidia of this type.

14. ***Marasmiellus* aff. *bolivarianus*** Singer, Beih. Nova Hedwigia 44: 324 (1973). – TYPE: Venezuela, Bolívar, Chimantá Massif, Toronó-tepuí, 1555–2090 m alt., on wooden litter, rotten wood in tropical forest, 23 February 1955, *J.A. Steyermark 1117 & J.J. Wurdack* (holotype NY). (Fig. 22, 23)

Pileus 4–8 mm diam., broadly convex to plano-convex or plane with straight margin, striate to sulcate, faintly translucent, glabrous to silky-felted, dry, white. ***Context*** very thin, soft and fragile, white. ***Lamellae*** narrow wly adnate, distant, with 1 series of lamellulae, narrow, white. ***Stipe*** 1–2 × 0.5 mm, eccentric, terete, equal, curved, solid, pruinose overall, insititious, white. ***Odour*** of garlic or rotten cabbage; ***taste*** similar. ***Basidiospores*** 6.4–8.8 × 3.2–4 µm (only 15 spores observed), ellipsoid, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** 15.2–20.8 × 5.6–6.4 µm, clavate, 4-spored. ***Basidioles*** fusoid to clavate. ***Cheilocystidia*** absent. ***Pleurocystidia*** absent. ***Pileipellis*** a cutis; hyphae 4–8 µm diam., incrusted, weakly diverticulate, thin-walled, hyaline to yellowish white, inamyloid. ***Pileal trama*** interwoven; hyphae 4–9.6 µm diam., incrusted, thin-walled, hyaline, inamyloid. ***Stipe tissue*** monomitic; hyphae 4–11.2 µm diam., thin- to thick-walled (up to 1.6 µm), diverticulate, hyaline, inamyloid. ***Stipe vesture*** absent. ***Clamp connections*** present.

Distribution. Indonesia (Bali) and Venezuela (Bolívar).

Fig. 22. *Marasmiellus* aff. *bolivarianus* Singer. From *D.E. Desjardin 7304*. (Photo: D.E. Desjardin)

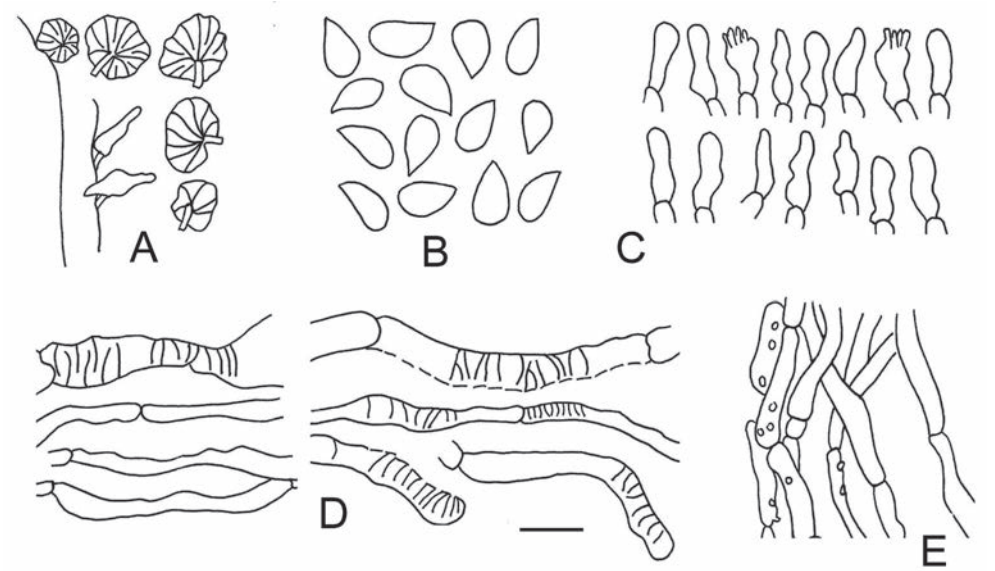

Fig. 23. *Marasmiellus* aff. *bolivarianus* Singer. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidia and basidioles. **D.** Pileipellis. **E.** Hyphae of stipe. Scale bar: B = 10 µm; C–E = 20 µm. Drawn by A. Retnowati from *D.E. Desjardin 7304*.

Habit and habitat. Densely gregarious on sticks of undetermined dicot in botanical garden area.

Additional specimen examined. INDONESIA: **Bali Province:** Eka Karya Botanical Garden, loop trail road at North East corner of garden, 22 Jan 2001, *Desjardin 7304* (BO).

Notes. The Indonesian material shows some similarities to *Marasmiellus bolivarianus* in macromorphology. Typical *Marasmiellus bolivarianus* differs, however, in having brown lamellar edges with numerous brown cheilocystidia. More specimens are needed to accurately determine the Indonesian taxon.

15. ***Marasmiellus pernambucensis*** Singer, Beih. Nova Hedwigia 44: 330 (1973). – TYPE: Brazil, Pernambuco, Caramagibe, on small sticks and vines, 14 July 1960, *R. Singer B 3408* (holotype F). (Fig. 24, 25)

Pileus 2–7 mm diam., convex, soon plano-convex, often with a shallow eccentric depression; margin decurved to straight, short-striate, hygrophanous; surface dull, dry to moist, opaque, glabrous to suede-like; white to buff overall, staining reddish brown with age. ***Context*** unobserved. ***Lamellae*** adnate to short-decurrent, subdistant, with 1–2 series of lamellulae, narrow, thick, non-marginate, white, staining reddish brown with age. ***Stipe*** 1–4 × 0.5–0.75 mm, eccentric, often curved, terete, cylindrical, equal, dry, insititious, pruinose to granulose overall, white to cream buff (4A2). ***Odour*** indistinct or sweet; ***taste*** indistinct. ***Basidiospores*** (6.4–)7.2–8 × 3.2–4 µm (x_{mr} = 7.5–7.6 × 3.4–3.8, x_{mm} = 7.50 ± 0.07 × 3.58 ± 0.32, Q = 1.6–2.5, Q_{mr} = 2–2.23, Q_{mm} = 2.12 ± 0.17, n = 25 spores per 2 specimens), ellipsoid, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** 20–24 × 4.8–8.8 µm, clavate, 4-spored. ***Basidioles*** fusoid to clavate. ***Cheilocystidia*** 13.6–29.4 × 3.2–9.6 µm, fusoid to clavate or irregular in shape, with a few diverticula, thin-walled, hyaline; diverticula 1.6–4 × 0.8 µm, conical to clavate, obtuse, thin-walled, hyaline. ***Pleurocystidia*** absent. ***Pileipellis*** a cutis; hyphae 1.6–5.6 µm diam., smooth or with a few diverticula, not incrusted, thin-walled, hyaline, inamyloid. ***Pileus trama*** interwoven; hyphae 3.2–5.6 µm diam., thin-walled, hyaline. ***Stipe tissue*** monomitic; hyphae 3.2–12 µm diam., cylindrical, parallel, some slightly incrusted, thick-walled (up to 2.4 µm), inamyloid. ***Stipe vesture*** common; caulocystidia 16–48 × 4–8 µm, cylindrical to clavate or irregular in shape, thin-walled, hyaline, inamyloid. ***Clamp connections*** present.

Distribution. Indonesia (Java).

Habit and habitat. Gregarious on twigs of undetermined dicots or fern rachis.

Additional specimens examined. INDONESIA: **West Java Province:** Cibodas Botanical Garden, trail to Mount Gede, 9 Jan 1998, *Desjardin 6742* (BO); Bogor, Ciapus, Curug Nangka, north slope of Mount Salak, 7 Jan 2000, *Desjardin 7057* (BO).

Fig. 24. *Marasmiellus pernambucensis* Singer. From *D.E. Desjardin 7057*. (Photo: D.E. Desjardin)

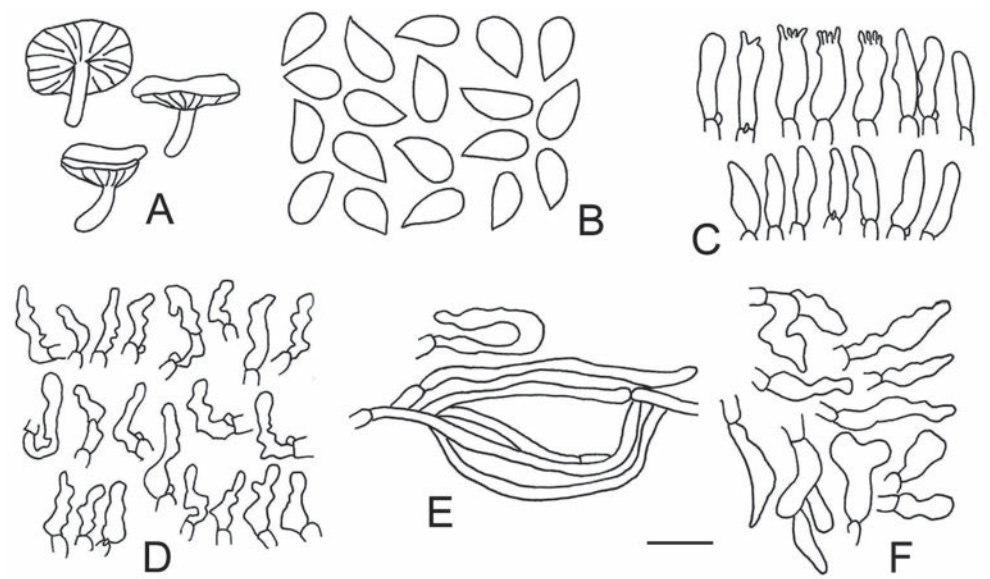

Fig. 25. *Marasmiellus pernambucensis* Singer. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidia and basidioles. **D.** Cheilocystidia. **E.** Pileipellis. **F.** Caulocystidia. Scale bar: B = 10 µm; C–F = 20 µm. Drawn by A. Retnowati from *D.E. Desjardin 7057*.

Notes. Marasmiellus pernambucensis was described by Singer from Brazil (Singer, 1973). The Indonesian material differs slightly from that described by Singer in having larger basidiospores (7.2–8 × 3.2–4 µm versus 4.5–7 × 2.3–3 µm in the type).

16. *Marasmiellus idroboi* Singer, Beih. Nova Hedwigia 44: 327 (1973). – TYPE: Colombia, Valle, Buenaventura, Calima, on woody stick, 23 April 1968, *R. Singer B 6333* (holotype F). (Fig. 26)

Pileus 2–5 mm diam., convex to plano-convex, dry, hygrophanous, translucent striate at the margin, smooth, glabrous, pure white overall. ***Context*** thick, concolorous to pileus. ***Lamellae*** adnate, distant (9–12), with 1 series of lamellulae, broad, non-marginate, pure white. ***Stipe*** 1–1.5 × 0.5 mm, eccentric, equal, insititious, smooth, glabrous to pruinose; pure white. ***Odour and taste*** indistinct. ***Basidiospores*** 7.2–8 × 3.2–4.8 µm (x_m = 7.52 ± 0.40 × 3.55 ± 0.47, Q = 1.67–2.50, Q_m = 2.14 + 0.23, n = 25 spores per 1 specimen), ellipsoid, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** 15.2–20 × 6.4–7.2 µm, clavate, 4-spored. ***Basidioles*** fusoid to clavate. ***Cheilocystidia*** common; main body 12–24 × 4–7.2 µm, fusoid to clavate, irregular in shape or coralloid with one or more broad finger-like projections, thin-walled, hyaline. ***Pleurocystidia*** absent. ***Pileipellis*** composed of a weak *Rameales*-structure; main body of terminal cells 16.56–29.44 µm, clavate to irregular in shape, with smooth or wavy edges, with or without a few diverticula, thin-walled; hyphae 4–8 µm diam., thin-walled, slightly incrusted, inamyloid. ***Pileal trama*** interwoven; hyphae 4.8–12 µm diam., weakly incrusted, thin-walled, hyaline, inamyloid. ***Stipe tissue*** monomitic; hyphae 2.4–5.6 µm diam., cylindrical, parallel, thin-walled, hyaline, inamyloid. ***Stipe vesture*** common; caulocystidia 11.2–34.4 × 4–8 µm, fusoid to clavate or irregular in shape, thin-walled, hyaline, inamyloid. ***Clamp connections*** present.

Distribution. Indonesia (Java) and Colombia (Valle).

Habit and habitat. Gregarious on wood.

Additional specimen examined. INDONESIA: **West Java Province:** Cibodas Botanical Garden, trail to Mount Gede, 22 Jan 1999, *Retnowati 152* (BO).

Notes. The pileipellis of this species was difficult to evaluate, but the presence of irregular terminal cells, some with a few diverticula, suggest a weak *Rameales*-structure. The Indonesian specimen differs from the type described from Colombia (Singer, 1973) in lacking a small cup-like disc at the stipe base, and in having a stipe vesture of irregular-shaped caulocystidia.

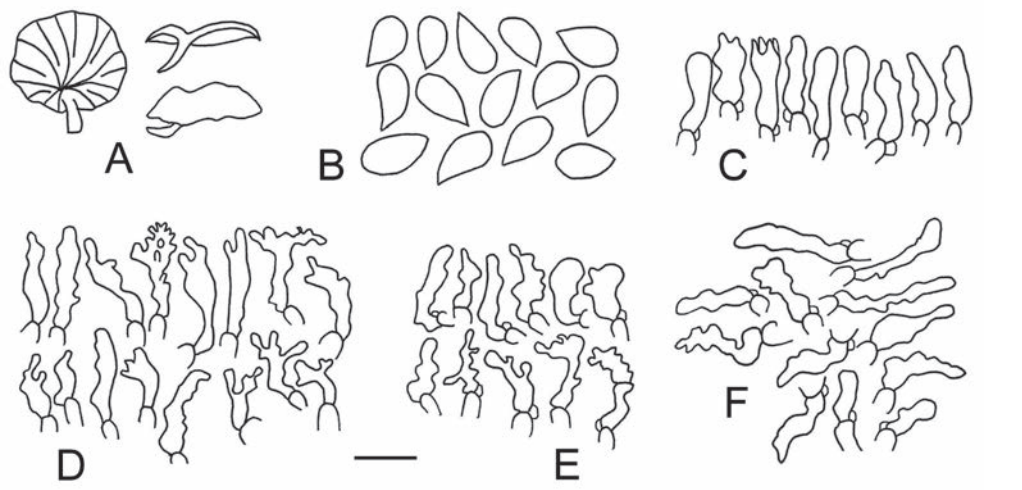

Fig. 26. *Marasmiellus idroboi* Singer. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidia and basidioles. **D.** Cheilocystidia. **E.** Pileipellis. **F.** Caulocystidia. Scale bar: B = 10 µm; C–F = 20 µm. Drawn by A. Retnowati from *A. Retnowati 152.*

Marasmiellus **Section** ***Rameales*** (J.Lange) Singer, Lilloa 22: 229 (1951).

17. ***Marasmiellus clavatus*** Retn., **sp. nov.** – TYPE: Indonesia, West Java Province, Sukabumi, Parung Kuda, Mount Halimun National Park, trail from Cikaniki, on dicot wood, 10 January 2001, *A.W. Wilson 73* (holotype BO). Mycobank: MB 821715. (Fig. 27)

Pileus 5.5–19 mm diam., plano-convex to concave, seldom subumbonate, undulating, moist, glabrous, smooth to finely rugulose, margin entire or lobed, translucent striate, slightly wavy, disc soda brown (6C6) to dark beige (5D5) becoming light beige at margin (4–5A2), strongly hygrophanous. ***Context*** 2 mm thick, dark beige (5D5). **Lamellae** adnexed to free, close to crowded, with multiple series of lamellulae, rarely anastomosing, 1 mm broad. ***Stipe*** 5–16 × 1 mm, central, cylindrical, fistulose, pliant, pruinose, dark brown at base (6–7EF–8) to at least half way up stipe, then lightening to beige/white (3–5A1–2). ***Odour and taste*** indistinct. ***Basidiospores*** (5.6–)6.4–7.2(–8) × 3.2–4 µm (x_m = 6.59 ± 0.74 × 3.94 ± 0.32, Q = 1.40–2.00, Q_m = 1.68 ± 0.15, n = 25 spores per 1 specimen), ellipsoid, smooth, hyaline, inamyloid, thin-walled. Basidia 20–20.8 × 4.8–5.6 µm, clavate, 4-spored. ***Basidioles*** fusoid to clavate. ***Cheilocystidia*** common, main body 24–34.4 × 10.4–18.4 µm, fusoid to clavate or ventricose, smooth, non-diverticulate, thin-walled, hyaline. ***Pleurocystidia*** absent. ***Pileipellis*** composed of a *Rameales*-structure; hyphae 4–7.2 µm diam., some with cylindrical to clavate terminal cells, with scattered diverticula, not incrusted, thin-walled, inamyloid, hyaline. ***Pileal trama*** interwoven; hyphae 4.8–12 µm diam., incrusted, thin- to thick-walled (up to 0.8 µm), hyaline, inamyloid. ***Stipe tissue*** monomitic; hyphae 4.8–10.4

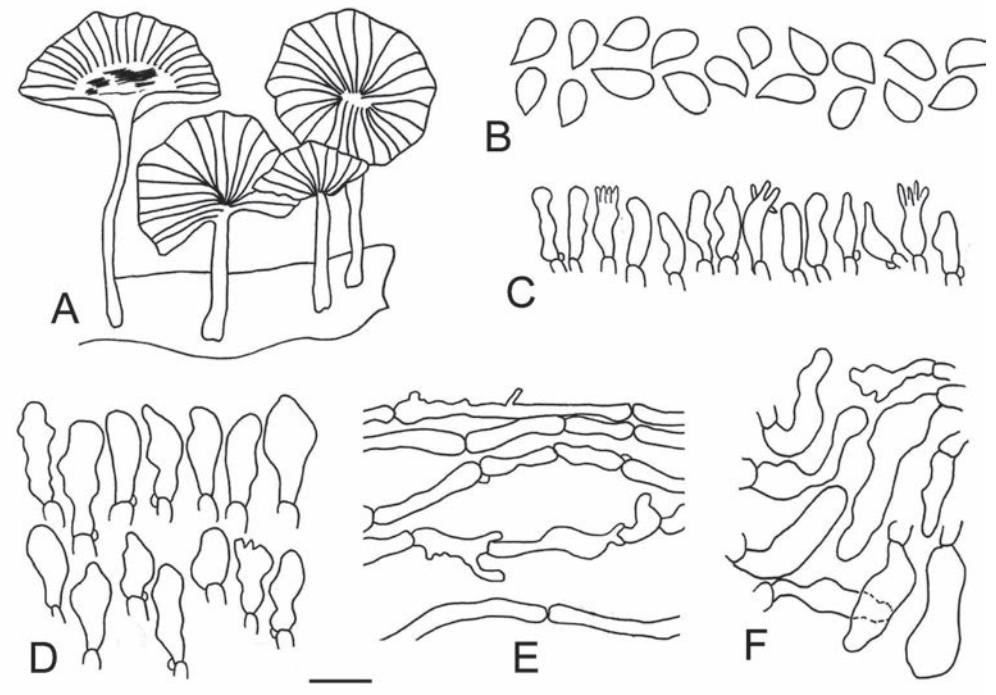

Fig. 27. *Marasmiellus clavatus* Retn. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidia and basidioles. **D.** Cheilocystidia. **E.** Pileipellis. **F.** Caulocystidia. Scale bar: B = 10 µm; C–F = 20 µm. Drawn by A. Retnowati from *A.W. Wilson 73.*

µm diam., thick-walled (up to 1.6 µm), hyaline, inamyloid. ***Stipe vesture*** common; caulocystidia 27.2–60 × 6.4–14.4 µm, fusoid to clavate or cylindrical, thick-walled (up to 0.8 µm), inamyloid. ***Clamp connections*** present.

Distribution. Indonesia (Java).

Habit and habitat. Scattered on dicot wood.

Etymology. The epithet *clavatus* refers to the clavate-shaped cheilocystidia.

Notes. Marasmiellus clavatus is similar to *M. corticigenus* (Berk. & Broome) Pegler, described from Sri Lanka, but the latter has cheilocystidia with distinctive apical knobs (Pegler, 1986).

18. ***Marasmiellus tamblinganensis*** Retn., **sp. nov.** – TYPE: Indonesia, Bali Province, Bedugul, Lake Tamblingan, on dicot twigs, 20 January 2001, *A. Retnowati 344* (holotype BO). Mycobank: MB 821716. (Fig. 28)

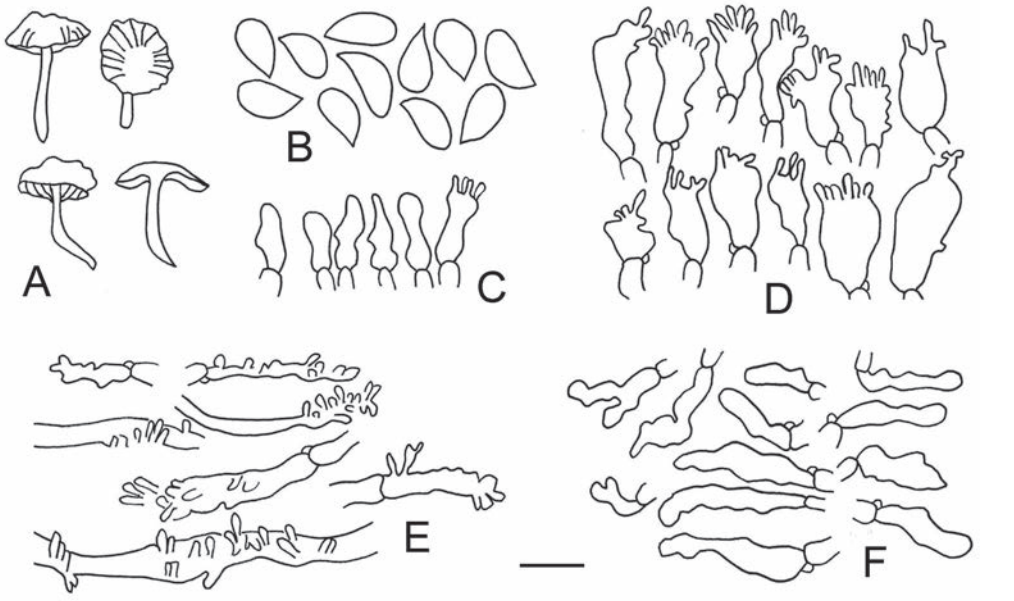

Fig. 28. *Marasmiellus tamblinganensis* Retn. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidium and basidioles. **D.** Cheilocystidia. **E.** Pileipellis. **F.** Caulocystidia. Scale bar: B = 10 µm; C–F = 20 µm. Drawn by A. Retnowati from *A. Retnowati 344*.

Pileus 2–15 mm diam., convex with or without a small umbo when young, then becoming plano-convex with age, hygrophanous; margin incurved when young, becoming outcurved when mature, crenate, striate to sulcate; surface smooth, glabrous; light yellow (4A4) with paler edge, pinkish white with age. ***Context*** up to 0.5 mm thick, concolorous with the pileus. ***Lamellae*** adnexed, subdistant to close (15–17), with 1–2 series of lamellulae, moderately broad (up to 1 mm), non-marginate; concolorous with the pileus. ***Stipe*** 4–14 × 0.5–1 mm, central, cylindrical, equal, hollow, insititious or with a small disc at the base, light brown with white granulose ornamentation. ***Odour and taste*** indistinct. ***Basidiospores*** of two sizes: (7.2–)8–9.6 × 3.2–4 µm (x_m = 8.74 ± 0.2 × 3.49 ± 0.2, Q = 1.8–3, Q_m = 2.53 ± 0.2, n = 25 spores per 4 specimens); and 8.8–12 × 2.4–3.2 µm (x_m = 10.34 ± 0.86 × 3.17 ± 0.16, Q = 2.75–3.75, Q_m = 3.27 ± 0.26, n = 25 spores per 4 specimens), ellipsoid to elongate-fusoid, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** 19.2–22.4 × 5.6–7.2 µm, 4-spored. ***Basidioles*** fusoid to clavate. ***Cheilocystidia*** common, composed of *Siccus*-type broom cells; main body 9.6–41.6 × 8–16 µm, fusoid to clavate, ventricose or irregular in shape, hyaline, thin-walled; setulae 1.6–10.4 × 0.8–3.2 µm, conical to fusoid or clavate, hyaline, thin-walled. ***Pleurocystidia*** absent. ***Pileipellis*** composed of a *Rameales*-structure; hyphae 3.2–9.6 µm diam., diverticulate, hyaline to greenish white, thin- to thick-walled (up to 0.8 µm), incrusted, inamyloid; diverticula 2.4–10.4 × 0.6–0.8 µm, conical to clavate, thin-walled. ***Pileus trama*** interwoven; hyphae 3.2–10.4 µm diam., thin-walled, hyaline to yellowish white, inamyloid. ***Stipe tissue*** monomitic; hyphae 1.6–10.4 µm diam., parallel, cylindrical, thin- to thick-walled (up 0.8 µm), inamyloid to weakly

dextrinoid. ***Stipe vesture*** common; caulocystidia 7.2–40 × 3.2–8.8 µm, fusoid to clavate or irregular in shape, often forked at the tips, non-diverticulate, thin- to thick-walled (up to 0.8 µm), inamyloid. ***Clamp connections*** present.

Distribution. Indonesia (Bali).

Habit and habitat. Gregarious on dicot twigs.

Additional specimens examined. INDONESIA: **Bali Province:** Tabanan, Baturiti, Candikuning, Eka Karya Botanical Garden, 19 Jan 2001, *Retnowati 341* (BO); Bedugul, Lake Tamblingan, 20 Jan 2001, *NY 8080* (BO); Bedugul, forest along Lake Beratan, 21 Jan 2001, *Retnowati 349* (BO).

Etymology. The epithet *tamblinganensis* refers to the locality where the species was collected in Tamblingan (Bali).

Notes. Four specimens were examined in this study and it was found that basidiospores of 3 specimens were (7.2–)8–9.6 × 3.2–4 µm, and another was 8.8–12 × 2.4–3.2 µm. All other features amongst the four specimens were indistinguishable. The light yellow pileus in combination with *Siccus*-type cheilocystidia and non-diverticulate caulocystidia are distinctive.

19. ***Marasmiellus setulosipes*** (Murrill) Dennis, Kew Bull., Addit. Ser. 3: 33 (1970). – *Marasmius setulosipes* Murrill, N. Amer. Fl. 9(4): 257 (1915). – TYPE: Bahama Islands, New Providence, Lake Cunningham, on dead fallen leaves and sticks, September 8, 1904, *Elizabeth G. Britton 651* (lectotype NY, designated here). (Fig. 29)

Pileus 5–10 mm diam., plano-convex, umbilicate, sulcate, glabrous, smooth, dry, hygrophanous; greyish white, with dark grey disc. ***Context*** thin, white to greyish white. ***Lamellae*** adnate to slightly subdecurrent, distant (8–9), with 1 series of lamellulae, narrow (up to 1.5 mm), pure white to greyish white. ***Stipe*** 4–8 × 0.5 mm, central to eccentric, equal, smooth, glabrous, colour not recorded. Odour and taste indistinct. ***Basidiospores*** of 2 sizes: 4.8–5.6 × 2.4–3.2 µm (x_m = 4.83 ± 0.16 × 3.04 ± 0.33, Q = 1.5–2.00, Q_m = 1.61 ± 0.21); and 6.4–7.2 × 3.2–4 µm (x_m = 6.69 ± 0.39 × 3.62 ± 0.41, Q = 1.60–2.25, Q_m = 1.87 ± 0.25, n = 25 spores per 1 specimen), ellipsoid, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** 16–20 × 3.2–4.8 µm, clavate, 4-spored. ***Basidioles*** clavate. ***Cheilocystidia*** common; main body 28–68 × 8–14.4 µm, fusoid to clavate or broadly clavate, with a very few short diverticula, thin-walled, hyaline. ***Pileipellis*** composed of a *Rameales*-structure; hyphae 2.4–6.4 µm diam., thin-walled, hyaline to yellowish brown, thinly incrusted, inamyloid. ***Stipe tissue*** monomitic; hyphae 2.4–3.2 µm diam., cylindrical, parallel, thin-walled, hyaline, inamyloid. ***Stipe vesture*** absent. ***Clamp connections*** rare.

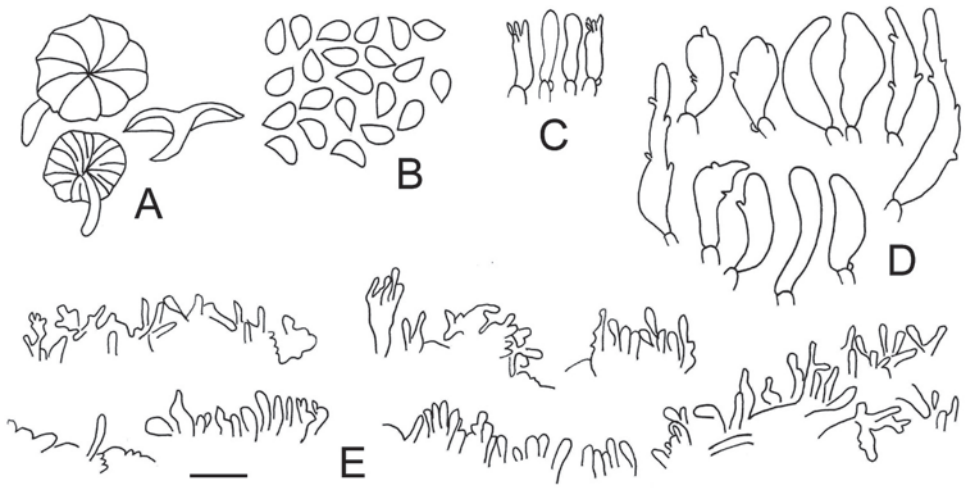

Fig. 29. *Marasmiellus setulosipes* (Murrill) Singer. **A.** Basidiomes. **B.** Basidiospores**. C.** Basidia and basidioles. **D.** Hymenial cystidia. **E.** Pileipellis. Scale bar: B = 10 µm; C–E = 20 µm. Drawn by A. Retnowati from *A. Retnowati 065*.

Distribution. Indonesia (Java).

Habit and habitat. Gregarious on wood.

Additional specimen examined. INDONESIA: **West Java:** Cibodas Botanical Garden, 29 Dec 1998, *Retnowati 065* (BO).

Notes. Marasmiellus setulosipes is distinguished by small basidiocarps with greyish white, sulcate pilei, distant lamellae, fusoid to clavate or broadly clavate cheilocystidia with or without a few diverticula, relatively small basidiospores, and a *Rameales*-type pileipellis.

20. *Marasmiellus delicius* (Berk. & Broome) Pegler, Kew Bull., Addit. Ser. 12: 114 (1986). – *Agaricus delicia* Berk. & Broome, J. Linn. Soc., Bot. 11: 527 (1871). – TYPE: Kandy District, Peradeniya, July 1869, *Thwaites 398* (lectotype K, designated here). (Fig. 30, 31)

Pileus 1–8 mm diam., convex, soon plano-convex to plane, sometimes with a shallow central depression, non-striate to short-striate, hygrophanous; margin inrolled when young, later becoming straight; surface dull, dry, opaque, glabrous, suede-like to pruinose; pure white overall, but discoloring reddish brown (8D4–5) or pale pinkish with age. ***Context*** extremely thin to thin (up to 0.5 mm), soft, white. ***Lamellae*** adnate to subdecurrent, subdistant (14–19), with 1–3 series of lamellulae, narrow to moderately

Fig. 30. *Marasmiellus delicius* (Berk. & Broome) Pegler. From *D.E. Desjardin 7306*. (Photo: D.E. Desjardin)

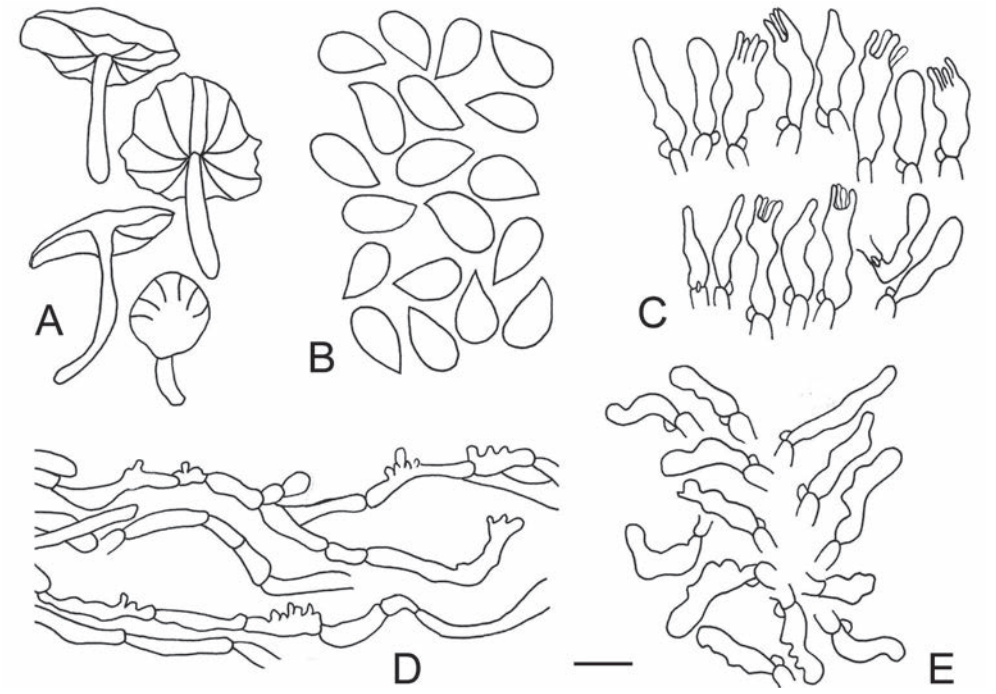

Fig. 31. *Marasmiellus delicius* (Berk. & Broome) Pegler. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidia and basidioles. **D.** Pileipellis. **E**. Caulocystidia. Scale bar: B = 10 µm; C–E = 20 µm. Drawn by A. Retnowati from *A. Retnowati 339*.

broad, convex, non-marginate, white. ***Stipe*** 2–6 × 0.5–0.75 mm, central to slightly eccentric or eccentric, curved, terete, equal above and enlarged base, hollow, tough, pliant, apex pruinose, base hirsute, dull, dry, non-insititious to sub-insititious; pure white but often discoloring with age to pinkish brown or pale reddish brown, base becoming yellow white (4A2) with age, with coarse, white rhizomorphs on substrate, often with a thin subiculum on the substrate. ***Odour*** indistinct or mild; ***taste*** indistinct or mild. ***Basidiospores*** 6.4–8.8 × 3.2–4(–4.8) µm (x_{mr} = 7.3–8.1 × 3.2–3.5, x_{mm} = 7.67 ± 0.4 × 3.36 ± 0.4, Q = 1.8–3, Q_{mr} = 2.1–2.5, Q_{mm} = 2.27 ± 0.2, n = 25 spores per 5 specimens), ellipsoid, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** 17.6–27.2 × 4.8–6.4 µm, clavate, 4-spored. ***Basidioles*** fusoid to clavate. ***Cheilocystidia*** absent. ***Pleurocystidia*** absent. ***Pileipellis*** a *Rameales*-structure; hyphae 2.4–5.6 µm diam., parallel, cylindrical, diverticulate, smooth to weakly incrusted, hyaline, inamyloid, thin- to thick walled (up to 0.8 µm). ***Pileus trama*** interwoven; hyphae 2.4–5.6 µm diam., cylindrical, slightly incrusted, inamyloid, hyaline, thin-walled. ***Stipe tissue*** monomitic; hyphae 2.4–10.4 µm diam., parallel, cylindrical, incrusted, with or without diverticula, hyaline, inamyloid, thin- to thick-walled (up to 0.8 µm). ***Stipe vesture*** common; caulocystidia 11.2–49.8 × 3.2–6.4 µm, clavate to broadly clavate, cylindrical or fusoid, hyaline, inamyloid, thin-walled. ***Clamp connections*** present.

Distribution. Indonesia (Bali and Java) and Sri Lanka.

Habit and habitat. Densely gregarious on undetermined dicot twigs or rattan stems in botanical garden and on the stem of a thorny vine in a primary forest area.

Additional specimens examined. INDONESIA: **Bali Province:** Tabanan, Baturiti, Candikuning, Eka Karya Botanical Garden, trail to Mount Pohen in primary forest area, 17 Jan 1998, *Desjardin 6802* (BO); Bedugul, by Lake Beratan along trail to Mount Catur, 1 Jan 2000, *Wilson 124* (BO, SFSU); Tabanan, Baturiti, Candikuning, Eka Karya Botanical Garden, 19 Jan 2001, *Retnowati 339* (SFSU); ibid., 22 Jan 2001, *Desjardin 7306* (SFSU). **West Java Province:** Cibodas Botanical Garden, 27 Oct 2000, *Retnowati 309* (BO).

Notes. Marasmiellus delicius is characterised by small basidiocarps with white pileus that discolors reddish brown, subdistant white lamellae, a white stipe that discolors like the pileus and arises from a thin subicuum, basidiospores with a mean of 7.7 × 3.4 µm, lacks cheilocystidia, has a *Rameales*-type pileipellis and numerous simple caulocystidia.

21. *Marasmiellus diverticulatus* Retn., **sp. nov.** – TYPE: Indonesia, Java, West Java, Mount Halimun National Park, trail from Cikaniki to Mount Halimun, on undetermined hardwood twigs, 13 January 1998, *D.E. Desjardin 6771* (holotype SFSU). Mycobank: MB 821717. (Fig. 32)

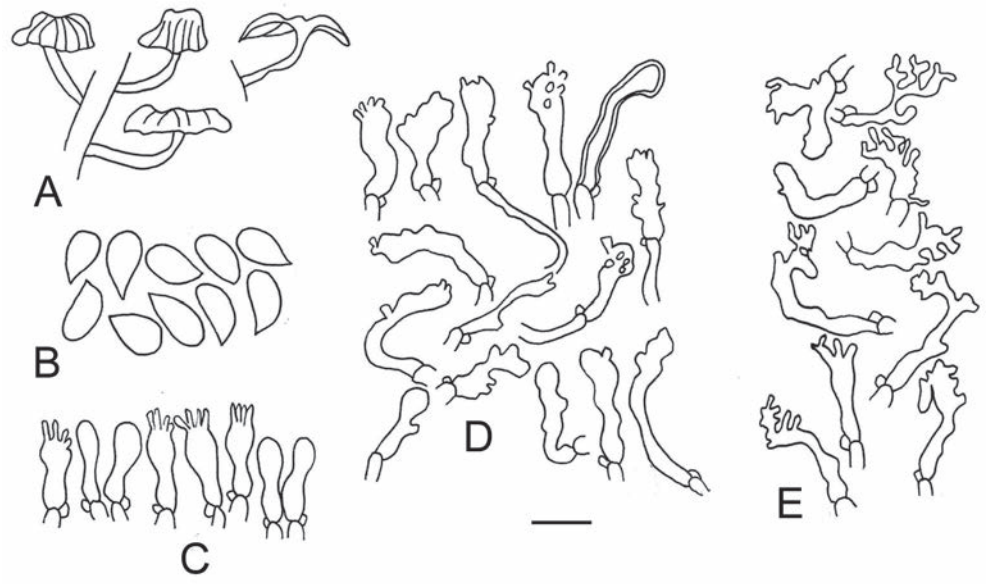

Fig. 32. *Marasmiellus diverticulatus* Retn. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidia and basidioles. **D.** Pileipellis. **E.** Stipe vesture. Scale bar: B = 10 µm; C–E = 20 µm. Drawn by A. Retnowati from *D.E. Desjardin 6771*.

Pileus 2–10 mm diam., conical with a pointed disc or convex when young, expanding to plano-convex, rugulo-striate to the rugulose disc, with or without a small rounded papilla, suede-like, strongly hygrophanous; margin inrolled in young specimens, becoming straight to slightly decurved with age; surface dull, dry, glabrous, opaque, pure white with a pale orangish white (5A2) disc. ***Context*** thick, white. ***Lamellae*** shallowly adnate to adnate, subdistant to distant (13–14 reaching stipe), with 1–2 series of lamellulae, narrow to moderately broad, convex to straight, non-marginate, white. ***Stipe*** 4–15 × 0.5–1 mm, central, terete, cylindrical, curved, tough, solid, pruinose overall, insititious, pure white. ***Odour and taste*** indistinct. ***Basidiospores*** 6.4–8(–8.8) × 3.2–4 µm (x_{mr} = 7.5–8.5 × 3.4–3.8, x_{mm} = 8 ± 0.68 × 3.63 ± 0.29, Q = 1.8–2.8, Q_{mr} = 2.21–2.23, Q_{mm} = 2.22 ± 0.01, n = 25 spores per 2 specimens), ellipsoid, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** 21.6–35.2 × 6.4–7.2 µm, clavate, 4-spored. ***Basidioles*** fusoid to clavate. ***Cheilocystidia*** absent. ***Pleurocystidia*** absent. ***Pileipellis*** composed of a *Rameales*-structure; hyphae 2.4–5.6 µm diam., smooth or diverticulate, thin-walled; terminal cells 12–24 × 5.6–8.8 µm, diverticulate, clavate to broadly clavate, not incrusted, thin- to thick-walled, inamyloid, hyaline to yellowish brown; diverticula 0.8–1.6 × 0.8 µm, conical, thin-walled. ***Pileus trama*** interwoven; hyphae 4–5.6 µm diam., thin- to thick-walled (up to 0.8 µm), hyaline, inamyloid. ***Stipe tissue*** monimitic; hyphae 4–8.8 µm, cylindrical, parallel, thin- to thick-walled, hyaline, inamyloid, incrusted. ***Stipe vesture*** like the pileipellis, composed of a *Rameales*-structure; terminal cells 24–49.6 × 4–6.4 µm, clavate to irregular shape, diverticulate, thin-walled to thick-walled, hyaline, inamyloid, slightly incrusted. ***Clamp connections*** present.

Distribution. Indonesia (Java).

Habit and habitat. Scattered to gregarious on undetermined hardwood twigs.

Additional specimens examined. INDONESIA: **West Java Province:** Sukabumi, Parung Kuda, Mount Halimun National Park, trail from Cikaniki to Mount Halimun, 10 Jan 2001, *Retnowati 337* (BO).

Etymology. The epithet *diverticulatus* refers to the presence of diverticulate elements in the pileipellis and stipe vesture.

Notes. The distinctive features of this new species are small, pallid basidiocarps with moderately-sized basidiospores (mean 8 × 3.6 µm), the absence of cheilocystidia, and a well-developed *Rameales*-structure on the pileus and stipe surfaces. It is similar to *Marasmiellus bermudensis* (Berk.) Singer, first described from a specimen collected in Paynter's Vale, Bermuda, but the latter forms cheilocystidia and has a flocculose stipe with long hair-like cells (Singer, 1973).

22. *Marasmiellus pipericola* Retn., **sp. nov.** – TYPE: Indonesia, Java, West Java Province, Sukabumi, Parung Kuda, Mount Halimun National Park, loop trail from Cikaniki, c. 1000 m asl, on bark of *Macropiper* sp., 8 January 1999, *D.E. Desjardin 6896* (holotype BO). Mycobank: MB 821718. (Fig. 33)

Pileus 2–3 mm diam., plano-convex to plane-depressed, non-striate, suede-like, dull, dry, pale greyish orange (5B3) overall. ***Context*** unobserved. ***Lamellae*** adnate, nearly poroid, forked, anastomosing, with 0 series of lamellulae, intervenose with age, narrow, buff, non-marginate. ***Stipe*** 1–2 × 0.1–0.2 mm, eccentric to central, terete, equal, insititious, glabrous above, pruinose below, tough; apex buff, base reddish brown (8E4) to brown (7E). ***Odour and taste*** indistinct. ***Basidiospores*** 7.2–8.8 × 2.4 µm (x_m = 8.29 ± 0.51 × 2.40 ± 0, Q = 3.00–3.67, Q_m = 3.45 ± 0.21, n = 25 spores per 1 specimen), narrowly ellipsoid to subcylindrical, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** 14–19 × 4.8–5.6 µm, clavate, 4-spored. ***Basidioles*** fusoid to clavate. ***Cheilocystidia*** common, composed of *Siccus*-type broom cells; main body 9–19 × 7.2–8 µm, fusoid to clavate, subglobose, or irregular in shape, thin-walled, hyaline; apical setulae 2–5 × 0.5–1.5 µm, cylindrical to conical, hyaline. ***Pleurocystidia*** absent. ***Pileipellis*** composed of a *Rameales*-structure; hyphae 4–8 µm diam., densely diverticulate, thin-walled, hyaline, weakly dextrinoid. ***Pileal trama*** interwoven; hyphae 4-4.8 µm diam., inamyloid, hyaline. ***Stipe tissue*** monomitic; hyphae 4–8 µm diam., parallel, cylindrical, densely diverticulate, thin-walled, hyaline, weakly dextrinoid. ***Stipe vesture*** absent. ***Clamp connections*** present.

Distribution. Indonesia (Java).

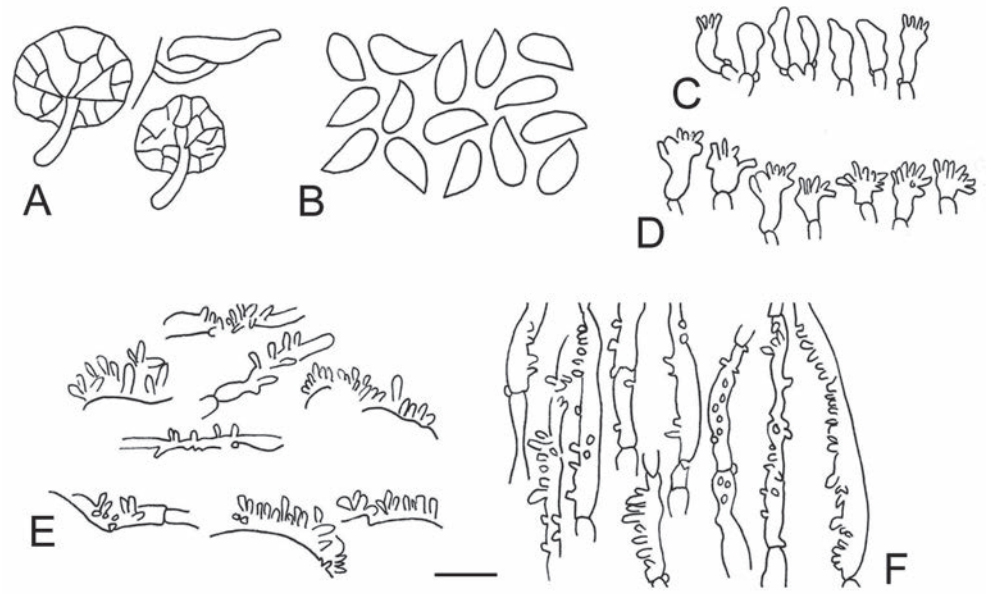

Fig. 33. *Marasmiellus pipericola* Retn. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidia and basidioles. **D.** Cheilocystidia. **E.** Pileipellis. **F.** Hyphae of stipe. Scale bar: B = 10 µm; C–F = 20 µm. Drawn by A. Retnowati from *D.E. Desjardin 6896.*

Habit and habitat. Densely gregarious on bark of a *Macropiper* sp.

Etymology. The epithet *pipericola* refers to the substrate on which the species grows (*Macropiper* sp., *Piperaceae*).

Notes. Distinctive features of *Marasmiellus pipericola* include small basidiocarps with non-striate, greyish orange pileus, nearly poroid hymenophore, short insititious stipe with buff apex and reddish brown base, narrowly ellipsoid basidiospores with mean Q = 3.45, *Siccus*-type cheilocystidia, and a *Rameales*-type pileipellis. This species is similar to *Marasmiellus stypinus* (Berk. & Broome) Pegler, described from Sri Lanka, but the latter differs in having larger basidiocarps (pileus 4–8 mm diam; stipe 10–15 mm long) with branched-nodulose cheilocystidia (Pegler, 1986).

23. ***Marasmiellus pruinosus*** Retn., **sp. nov.** – TYPE: Indonesia, Java, West Java Province, Sukabumi, Parung Kuda, Mount Halimun National Park, loop trail from Cikaniki, c. 1000 m asl, on undetermined dicot leaves, 8 January 1999, *D.E. Desjardin 6889* (holotype BO). Mycobank: MB 821719. (Fig. 34, 35)

Pileus 1–4 mm diam., convex to obtusely conical or plano-convex, often shallowly depressed, margin non-striate at first, remaining so or becoming striatulate with age, decurved; surface suede-like, dull, dry, disc light orange (5A3) to pinkish buff with

Fig. 34. *Marasmiellus pruinosus* Retn. From *D.E. Desjardin 6787*. (Photo: D.E. Desjardin)

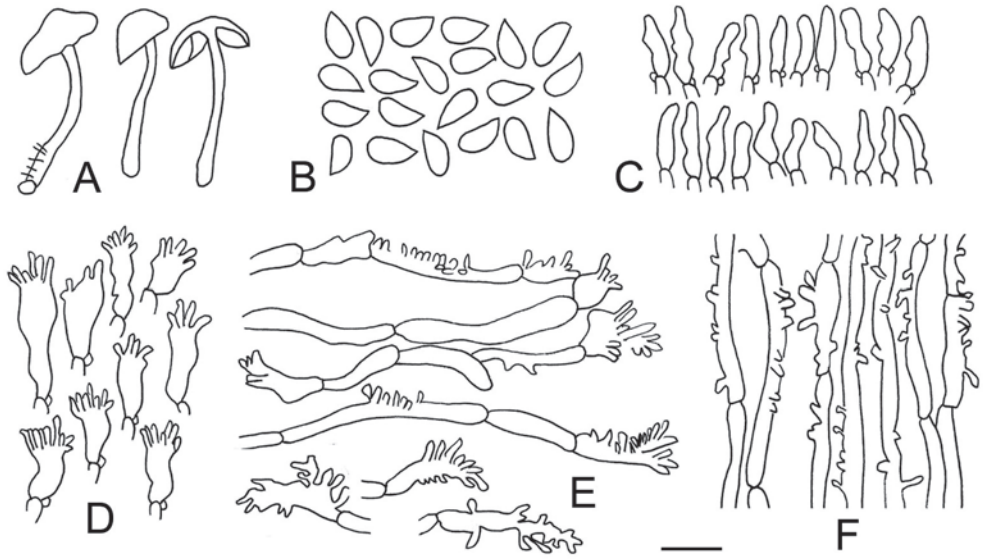

Fig. 35. *Marasmiellus pruinosus* Retn. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidioles; **D.** Cheilocystidia; **E.** Pileipellis; **F.** Hyphae of stipe. Scale bar: B = 10 µm; C–F = 20 µm. Drawn by A. Retnowati from *D.E. Desjardin 6889*.

pale orangish white (5A2) margin, or white to buff or very pale yellowish white (<4A2) overall. ***Context*** unobserved. ***Lamellae*** adnate, subdistant to distant (8–10), with 1–2 series of lamellulae, convex, moderately broad, edges granulose, white to buff. ***Stipe*** 1–4 × 0.2–0.4 mm, central, terete, equal above an enlarged base, curved, insititious, pruinose to granulose overall, tough, dull, dry; glabrous to pruinose above, furfuraceous to pruinose at the base, tough; white to pale yellowish white (4A2) or pale orangish white (5A2) when young, base becoming reddish brown (8D4-5) with age. ***Odour and taste*** indistinct. ***Basidiospores*** 5.6–7.2 × 2.4–3.2 µm (x_m = 6.43 ± 0.43 × 2.6 ± 0.2, Q = 2.33–3.00, Q_m = 2.68 ± 0.18, n = 25 spores per 3 specimens), narrowly ellipsoid, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** unobserved. ***Basidioles*** fusoid to clavate. ***Cheilocystidia*** common, composed of *Siccus*-type broom cells; main body 12–17.6 × 8–12.8 µm, clavate to broadly clavate, subglobose or irregular in shape, with diverticula, thin-walled, hyaline; apical setulae 2.4–16 × 0.8–1.6 µm, obtuse, conical to cylindrical, thin-walled, hyaline. ***Pleurocystidia*** absent. ***Pileipellis*** composed of a *Rameales*-structure; hyphae 4–6.4 µm diam., diverticulate, thin-walled, hyaline, inamyloid, non-incrusted; diverticula 3.2–8 × 0.8 µm, numerous, obtuse, conical to cylindrical, thin-walled, hyaline, inamyloid. ***Pileus trama*** interwoven; hyphae 2.4–8.8 µm diam., thin-walled, hyaline, inamyloid. ***Stipe tissue*** monomitic; hyphae 2.4–4 µm diam., diverticulate, cylindrical, parallel, thin-walled, hyaline, weakly dextrinoid to dextrinoid. ***Stipe vesture*** a *Rameales*-structure; hyphae similar to those in pileipellis; terminal cells 16–20 × 4.8–5.6 µm, fusoid to clavate, diverticulate, thin-walled, hyaline. ***Clamp connections*** present.

Distribution. Indonesia (Java).

Habit and habitat. Scattered to solitary on various veins that cling to buttress roots of *Ficus* L. tree, to densely gregarious on hardwood leaves, under *Castanopsis* or undetermined dicot leaves.

Etymology. The epithet *pruinosus* refers to the waxy powdery stipe of the species.

Additional specimens examined. INDONESIA: **West Java Province:** Sukabumi, Parung Kuda, Mount Halimun National Park, loop trail from Cikaniki, 14 Jan 1998, *Desjardin 6787* (BO); Sukabumi, Parung Kuda, Mount Halimun National Park, loop trail from Cikaniki, c. 1000 m asl, 8 Jan 1999, *Desjardin 6895* (BO).

Notes. Marasmiellus pruinosus is similar to the preceding species, *M. pipericola*, but *M. pruinosus* differs in lacking a poroid hymenophore, and in having smaller basidiospores (mean 6.4 × 2.6 µm, mean Q = 2.7).

24. ***Marasmiellus umbilicatus*** Singer, Beih. Nova Hedwigia 44: 333 (1973). – TYPE: Colombia, Valle, Buenaventura, Juanchaco, on fallen leaves and leaf petioles, 21 April 1968, *R. Singer B 6270* (holotype F). (Fig. 36, 37)

Fig. 36. *Marasmiellus umbilicatus* Singer. From *A. Retnowati 150*. (Photo: D.E. Desjardin)

Pileus 5–49 mm diam., irregularly circular in top view, plano-convex in profile, becoming depressed with age, translucent striate, strongly hygrophanous; margin straight to wavy, crenate in a few specimens; surface dull, dry, pruinose to tomentose; disc orangish brown, margin off-white, turning dark red-brown with age. ***Context*** up to 0.5 mm thick, off-white to reddish brown. ***Lamellae*** adnate to subdecurrent or decurrent, subdistant (13–20) to distant, with 2–4 series of lamellulae; narrow to moderately broad; non-marginate; off-white to white. ***Stipe*** 7–25 × 1–3 mm, central to eccentric, equal to cylindrical, slightly tapered at the base, sometimes with a small basal bulb, hollow, shiny, glabrous to pruinose or fibrillose, non-insititious; apex beige, becoming reddish brown to pale brown towards the base; basal tomentum present. ***Taste and odour*** indistinct. ***Basidiospores*** 4–6.4(–7.2) × 2.4–3.2(–4) µm, (x_{mr} = 4.9–5.8 × 2.6–3.2, x_{mm} = 5.41 ± 0.4 × 2.86 ± 0.3, Q = 1.4–3, Q_{mr} = 1.7–2.1, Q_{mm} = 1.92 ± 0.2, n = 25 spores per 6 specimens), ellipsoid, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** 16–24 × 4–5.6 µm, clavate, 4-spored. ***Basidioles*** fusoid to clavate. ***Cheilocystidia*** 16.8–40 × 6.4–16 µm, polymorphic, ranging from cylindrical to clavate or fusoid, with or without small diverticula, thin-walled, hyaline. ***Pleurocystidia***

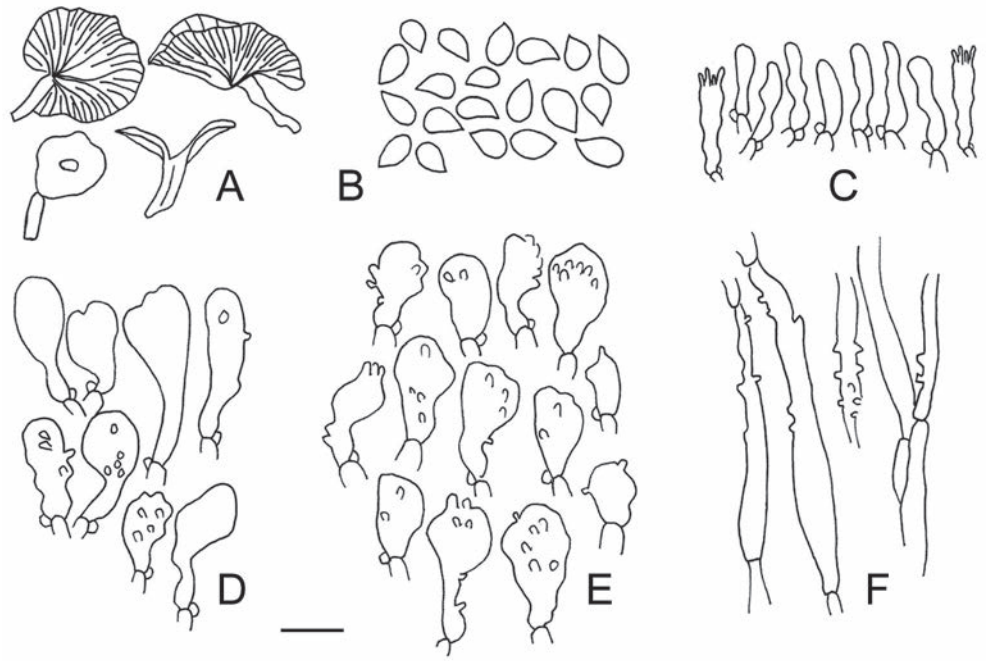

Fig. 37. *Marasmiellus umbilicatus* Singer. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidia and basidioles. **D.** Cheilocystidia. **E.** Pileipellis. **F.** Hyphae of stipe. Scale bar: B = 10 µm; C–F = 20 µm. Drawn by A. Retnowati from *A. Retnowati 743*.

absent. ***Pileipellis*** composed of a *Rameales*-structure; terminal cells 12–45.6 × 8–19.2 µm, clavate to irregular in shape, diverticulate, slightly incrusted, thin- to thick-walled (up to 0.8 µm), hyaline, inamyloid, incrustations dextrinoid. ***Pileal trama*** interwoven; hyphae 1.2–13.6 µm diam., thin- to thick-walled (up to 1.6 µm), hyaline. ***Stipe tissue*** monomitic; hyphae 2.4–10.4 µm diam., with or without diverticula, hyaline, thin- to thick-walled (up to 2.4 µm), inamyloid to weakly dextrinoid. ***Stipe vesture*** absent. ***Clamp connections*** present.

Distribution. Indonesia (Java and Bali) and Colombia (Valle).

Habit and habitat. Scattered to gregarious on decaying dicot wood or bark of *Castanopsis.*

Additional specimens examined. INDONESIA: **Bali Province:** Tabanan, Baturiti, Candikuning, Eka Karya Botanical Garden, 16 Jan 1998, *Collins 98–35* (SFSU); ibid., 14 Jan 2000, *Retnowati 180* (BO); Bedugul, Tamblingan trail, south side of Lake Tamblingan, near Bedugul, 18 Jan 1998, *Collins 98–44* (SFSU). **West Java Province:** Cibodas Botanical Garden, trail to Mount Gede, 22 Jan 1999, *Retnowati 150* (BO); ibid., montane rain forest, 1430–1500 m asl, 10 Jan 2000, *Horak 8386* (BO); Sukabumi, Parung Kuda, Mount Halimun-Salak National Park, Cidahu, Pameungpeuk trail, Plot Ecology-LIPI, 8 May 2010, *Retnowati 743* (BO).

Notes. The Indonesian specimens are tentatively determined as *Marasmiellus umbilicatus*, a species described from Colombia. Singer (1973) reported the Colombian material as lacking cheilocystidia, whereas the Indonesian material has cheilocystidia similar to *Rotalis*-type cells.

25. ***Marasmiellus nanus*** (Massee) Dennis, Kew Bull., Addit. Ser. 3: 33 (1970). – *Marasmius nanus* Massee, J. Bot. 30: 161 (1892). – TYPE: St. Vincent, Morne Cochon, on bark of fallen trees, 7 May 1892, *Elliot s.n.* (lectotype K, designated here). (Fig. 38)

Pileus 9–50 mm diam., convex, becoming broadly convex, umbilicate to infundibuliform with age, shiny, especially with age, margin translucent striate, uplifted, crisped; surface moist to dry, smooth to wrinkled, hygrophanous, glabrous, light brown overall or with a brownish pink to reddish brown (8E4) disc and off-white to cream margin, turning brownish pink overall upon bruising. ***Context*** moderately thick to thick (up to 1.5 mm), concolorous with pileus. ***Lamellae*** adnate to adnexed or subdecurrent, subdistant (16–19), with 2–3 series of lamellulae, moderately broad (about 5 mm), concolorous with the pileus, non-marginate or with a slightly orangish brown margin, bruising brownish pink. ***Stipe*** 10–39 × 1–4 mm, central, equal but swollen a little at base, usually curved, solid when young, becoming hollow with age, non-insititious, shiny, glabrous, longitudinally striate, off-white to light brown, orangish brown or reddish brown; base with white tomentum. ***Odour and taste*** indistinct. ***Basidiospores*** 4.8–6.4 × 2.4–4 µm (x_{mr} = 4.9–6 × 2.4–3.3, x_m = 5.49 ± 0.5 × 2.86 ± 0.4, Q = 1.5–2.7, Q_{mr} = 1.76–2.05, Q_{mm} = 1.95 ± 0.1; n = 25 spores per 4 specimens), ellipsoid, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** 11.2–20 × 4–5.6 µm, clavate, 4-spored. ***Basidioles*** fusoid to clavate. ***Cheilocystidia*** 8.8–52(–122) × 8–20 µm, clavate to broadly clavate, non-diverticulate, hyaline to yellowish brown, inamyloid, thin- to thick-walled (up to 0.8 µm). ***Pleurocystidia*** absent. ***Pileipellis*** composed of a *Rameales*-structure; terminal cells 16.8–32 × 8.8–13.6 µm, fusoid to clavate or irregular in shape, diverticulate, thin-walled, hyaline to yellowish brown, inamyloid; diverticula 1.6–5.6 × 1.6 µm, conical, thin-walled, hyaline. ***Pileus trama*** interwoven; hyphae 3.2–11.2 µm diam., thin-walled, hyaline, inamyloid. ***Stipe tissue*** monomitic; hyphae 2.4–11.2 µm diam., diverticulate, thin- to thick-walled (up to 1.6 µm), hyaline, inamyloid. ***Stipe vesture*** absent. ***Clamp connections*** present.

Distribution. Indonesia (Java) and St. Vincent.

Habit and habitat. Scattered on litter or wood or gregarious on bark of living trees.

Additional specimens examined. INDONESIA: **West Java Province:** Cibodas Botanical Garden, 9 Jan 1998, *Collins 98–8* (BO); Cibodas Botanical Garden, trail to Mt. Gede, 23 Jan1999, *Desjardin 6988* (BO); Cibodas Botanical Garden, trail to Mt. Gede, 13 Feb 2000, *Retnowati 207* (SFSU); Bogor Botanical Garden, 5 May 2000, *Retnowati 268* (BO).

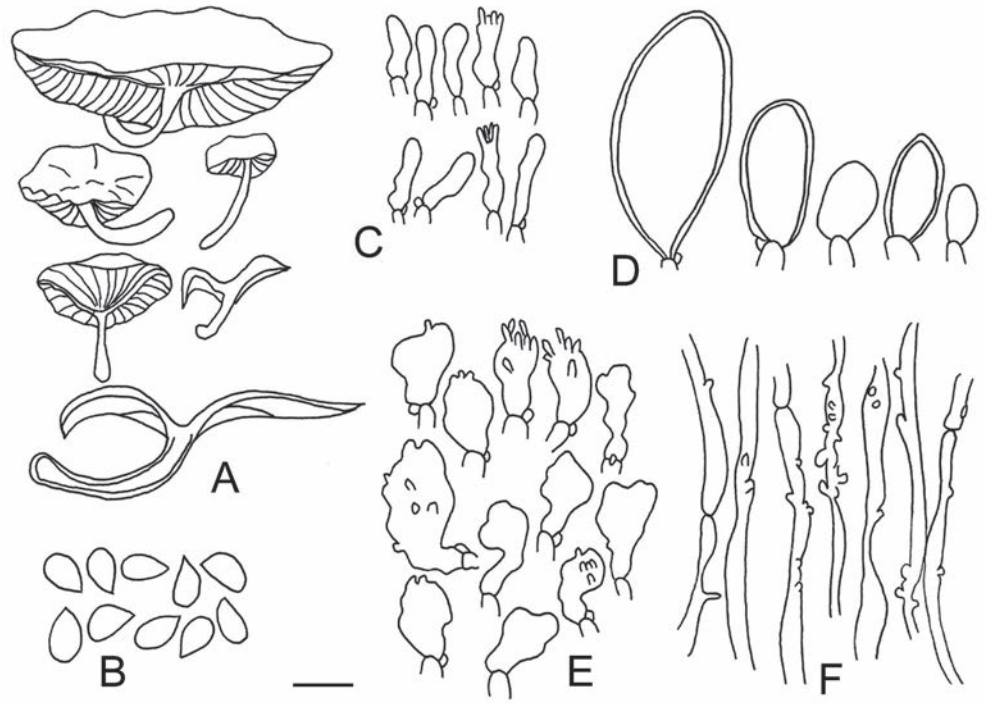

Fig. 38. *Marasmiellus nanus* (Massee) Dennis. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidia and basidioles. **D.** Cheilocystidia. **E.** Pileipellis. **F.** Hyphae of stipe. Scale bar: B = 10 µm; C–F = 20 µm. Drawn by A. Retnowati from *A. Retnowati 268.*

Notes. The broadly clavate, non-diverticulate cheilocystidia are distinctive features of *Marasmiellus nanus*. The Indonesian material differs from the New World material (described from the Caribbean island of St. Vincent) by forming larger basidiocarps with more deeply pigmented pilei.

Marasmiellus* Section *Candidi (Bat.) Singer, Sydowia 15: 58 (1961).

26. *Marasmiellus subnigricans* (Murrill) Singer, Beih. Nova Hedwigia 44: 26 (1973). – *Marasmius subnigricans* Murrill, Bull. Torrey Bot. Club 67: 152 (1940). – TYPE: USA, Florida, Alachua Co., Gainesville, on small stems and twigs, 1 July 1938, *Murrill s.n.* (lectotype FLAS, designated here). (Fig. 39, 40)

Pileus 11–45 mm diam., convex-umbonate to plano-convex, with or without a small umbo, often deeply depressed with uplifted margin with age, wavy, sulcate to disc, moist, hygrophanous, subtranslucent to strongly translucent, rubbery-membranous, dull, glabrous, rugulose; disc brown (6–7E6–8), elsewhere dingy cream (4A2–3) to beige, staining in spots brown to reddish brown (7–8E7–8) or pure white to off-white, darkening when dried. ***Context*** thin to thick, light brown. ***Lamellae*** adnate to

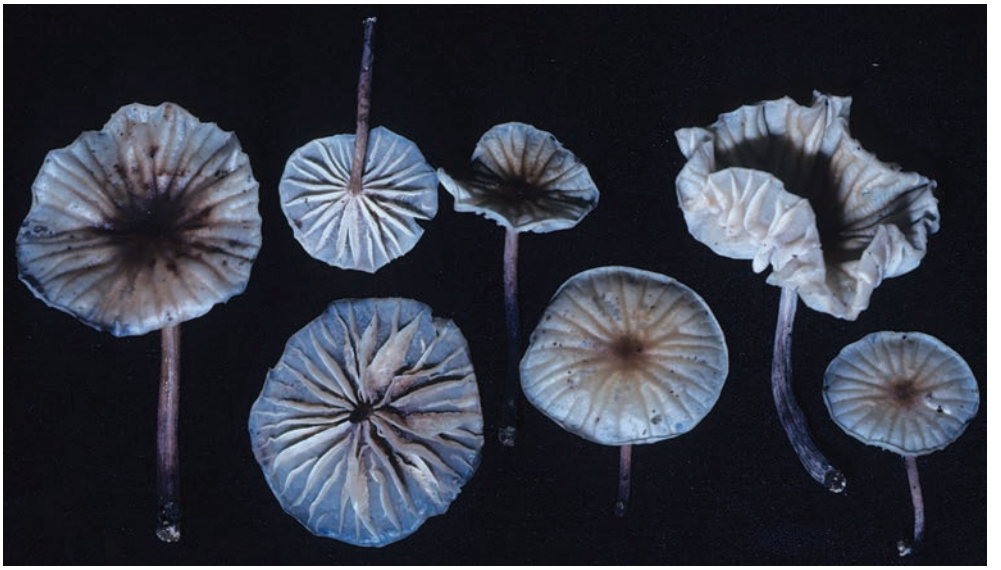

Fig. 39. *Marasmiellus subnigricans* (Murrill) Singer. From *D.E. Desjardin 7074*. (Photo: D.E. Desjardin)

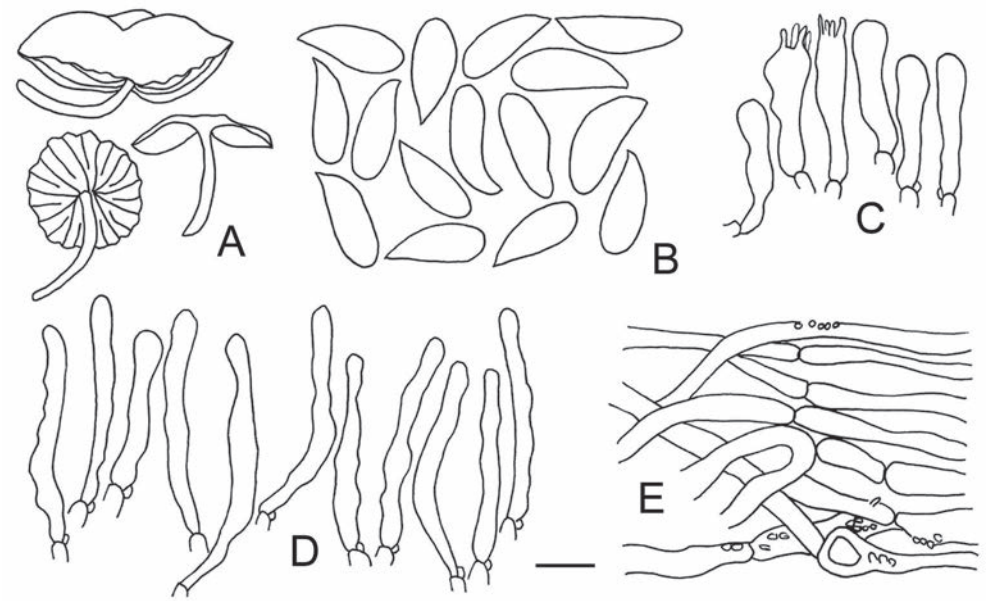

Fig. 40. *Marasmiellus subnigricans* (Murrill) Singer. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidia and basidioles. **D.** Cheilocystidia. **E.** Pileipellis. Scale bar: B = 10 µm; C–E = 20 µm. Drawn by A. Retnowati from *A. Retnowati 333*.

adnexed, subdistant (7–14) to distant (10–15), with 1–2 series of lamellulae, broad (< 6 mm), convex, white to dingy cream or pinkish buff (5A3), non-marginate, spotted reddish brown as in pileus. ***Stipe*** 13–50 × 1–3 mm, central to slightly eccentric, equal, tough, solid, becoming hollow, striate, pruinose overall, smooth, dry, subinsitititious to non-insitititious, off-white to brown (7E4–6) above, base dark brown (7F4–6), with white basal tomentum. ***Odour and taste*** indistinct. ***Basidiospores*** (12.8–)13.6–17.6(–18.40) × 4–5.6 µm (x_{mr} = 14.2–16.4 × 4–5.5, x_{mm} = 15.08 ± 1 × 4.86 ± 0.6, Q = 2.4–4.5, Q_{mr} = 2.83–3.57, Q_{mm} = 3.15 ± 0.3; n = 25 spores per 5 specimens), cylindrical, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** 24–32 × 8–8.8 µm, clavate, 4-spored. ***Basidioles*** clavate. ***Cheilocystidia*** common; main body 36.8–84 × 4–15.2 µm, cylindrical, non-diverticulate, thin-walled, hyaline. ***Pleurocystidia*** absent or scattered, similar to the cheilocystidia. ***Pileipellis*** a cutis; hyphae 5.6–8 µm diam., hyphae 3–11.2 µm diam., cylindrical, non-incrusted, thin-walled, hyaline, inamyloid; terminal cells not differentiated. ***Pileus trama*** interwoven; hyphae 3.2–16 µm diam., thin-walled, hyaline, inamyloid. ***Stipe tissue*** monomitic; hyphae 1.6–9.6 µm diam., parallel, cylindrical, thin-walled, hyaline to yellowish brown, inamyloid. ***Stipe vesture*** absent. ***Clamp connections*** present.

Distribution. Indonesia (Java and Bali), USA and Argentina.

Habit and habitat. Gregarious on rotten undetermined dicot wood and twigs in Botanical Garden.

Additional specimens examined. INDONESIA: **Bali Province:** Bedugul, east of Lake Beratan, south ridge of Mountain Catur, 17 Jan 1999, *Retnowati 142* (SFSU). **West Java Province:** Bogor Botanical Garden, 8 Jan 2000, *Desjardin 7074* (BO, SFSU); Sukabumi, Parung Kuda, Mount Halimun National Park, Cikaniki, loop trail Perth Zoo, 9 Jan 2001, *Retnowati 333* (BO). **Banten Province:** Banten, Serang, Ujung Kulon National Park, southern part of Mount Honje, trail to Jago Besar (c. 100 m asl), 16 Jun 2008, *Retnowati 609* (BO).

Notes. Marasmiellus subnigricans is characterised by a dingy cream pileus that darkens with age and on drying, large basidiospores with a mean of 15 × 4.8 µm, and the presence of cylindrical hymenial cystidia.

27. *Marasmiellus albofuscus* (Berk. & M.A.Curtis) Singer, Beih. Nova. Hedwigia 44: 24 (1973). – *Marasmius albofuscus* Berk. & M.A.Curtis, J. Linn. Soc., Bot. 10: 295 (1869). – TYPE: Cuba, on logs or woods, *Wright 87* (holotype FH). (Fig. 41)

Pileus 4–8 mm diam., campanulate to convex, with slightly depressed disc, hygrophanous, sulcate; margin incurved; surface glabrous, dry, dull, off-white. ***Context*** moderately thick, cream. ***Lamellae*** adnate, subdistant, with 0 series of lamellulae, moderately broad, off-white. ***Stipe*** 4–8 × 1 mm, central, cylindrical, insititious, dull, dry, glabrous, off-white. ***Odour and taste*** indistinct. Basidiospores (12–)12.8–13.6(–14.4)

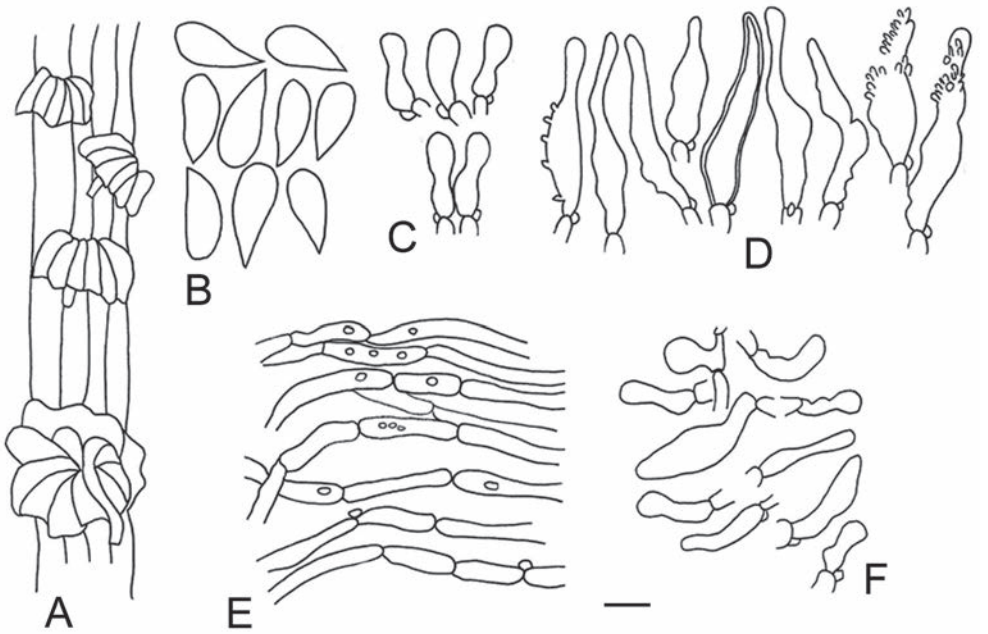

Fig. 41. *Marasmiellus albofuscus* (Berk. & M.A.Curtis) Singer. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidioles. **D.** Cheilocystidia. **E.** Pileipellis. **F.** Caulocystidia. Scale bar: B = 10 µm; C–F = 20 µm. Drawn by A. Retnowati from *A. Retnowati 817*.

× 4.8–5.6(–6.4) µm (x_m = 13.12 ± 0.65 × 4.99 ± 0.53, Q = 1.88–3.40, Q = 2.66 ± 0.31, n = 25 spores per 1 specimen), fusoid, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** unobserved. ***Basidioles*** clavate. ***Cheilocystidia*** common; main body 37.6–68.8 × 7.2–12 µm, clavate to cylindrical or narrowly lageniform, without or with a few diverticula on the upper half, thin- to thick-walled (up to 0.8 µm), arising from the lamellar trama. ***Pleurocystidia*** absent or scattered, similar to the cheilocystidia. ***Pileipellis*** a cutis; hyphae 3.2–8.8 µm diam., smooth or weakly diverticulate, thin- to thick-walled, hyaline, inamyloid, not incrusted. ***Pileal trama*** interwoven; hyphae 3.2–9.6 µm diam., thin-walled, inamyloid. ***Stipe tissue*** monomitic; hyphae 4–6.4 µm diam., thin-walled, hyaline, inamyloid. ***Stipe vesture*** uncommon; caulocystidia 20–44 × 6.4–12 µm, clavate to ventricose, thin-walled, hyaline, inamyloid. ***Clamp connections*** present.

Distribution. Indonesia (Java) and Cuba.

Habit and habitat. Gregarious on monocotyledons.

Additional specimen examined. INDONESIA: **West Java Province:** Bogor, Bogor Botanical Garden, 1 December 2010, *Retnowati 817* (BO).

Notes. Marasmiellus albofuscus is characterised by small, white basidiocarps with large basidiospores (mean 13.2 × 5 µm) and the presence of clavate to cylindrical hymenial cystidia. Indonesian material of *Marasmiellus subnigricans* is similar but differs in forming a more pigmented pileus that dries darker and it has larger basidiospores (mean 15 × 4.8 µm). *Marasmiellus coilobasis* (Berk.) Singer, from South America, is also similar, but it too has larger basidiospores (11.5–19 × 4–7.8(–8.2) µm from 4-spored basidia or (17–)19–25(–27.5) × 5.5–6.2 µm from 2-spored basidia) (Singer, 1973).

Marasmiellus* Section *Dealbati Singer, Beih. Nova Hedwigia 44: 33 (1973).

28. *Marasmiellus cikanikiensis* Retn., **sp. nov.** – TYPE: Indonesia, West Java Province, Sukabumi, Parung Kuda, Mount Halimun National Park, road from Cikaniki to Bogor, on dicot wood, 11 January 2001, *A.W. Wilson 79* (holotype BO). Mycobank: MB 821720. (Fig. 42)

Pileus c. 19 mm diam., convex to plano-convex or plane, depressed with age, margin translucent striate, entire to undulate-crenate, glabrous, smooth, moist, hygrophanous, white to creamy white (3–4A3–3). ***Context*** thick, off-white. ***Lamellae*** adnate to slightly decurrent, distant, with 2 series of lamellulae, forked, 1.5–2 mm broad, white to creamy white. ***Stipe*** 3–13 × 0.5–1 mm, central, cylindrical, pliant, solid, flocculose, white to creamy white. ***Odour and taste*** indistinct. ***Basidiospores*** 8–8.8 × 3.2–4(–4.8) µm (only 16 basidiospores observed), ellipsoid, smooth, hyaline, inamyloid, thin-walled. Basidia 20.8–24 × 5.6–6.4 µm, clavate, 4-spored. ***Basidioles*** clavate. ***Cheilocystidia*** absent. ***Pleurocystidia*** absent. ***Pileipellis*** a cutis; hyphae 4–10.4 µm diam., smooth or with a few diverticula, non-incrusted, thin-walled, hyaline to yellowish white, inamyloid. ***Pileus trama*** interwoven; hyphae 4–12 µm diam., thin-walled, inamyloid. ***Stipe tissue*** monomitic; hyphae 4–16 µm diam., cylindrical, parallel, thin-walled, smooth or diverticulate, inamyloid. ***Stipe vesture*** common at stipe apex; caulocystidia 16–40 × 4–8.8 µm, clavate or irregular in shape, thin-walled, hyaline. ***Clamp connections*** present.

Distribution. Indonesia (Java).

Habit and habitat. Gregarious on dicot wood.

Etymology. The epithet *cikanikiensis* refers to the locality where the type specimen was collected.

Notes. Marasmiellus cikanikiensis is characterised by white to creamy white basidiocarps, basidiospores in the range 8–8.8 × 3.2–4 µm, no cheilocystidia, a cutis-type pileipellis of mostly smooth hyphae, and clavate caulocystidia. It is similar to *Marasmiellus dealbatus* (Berk. & M.A.Curtis) Singer and *M. stenophyllus* (Singer,

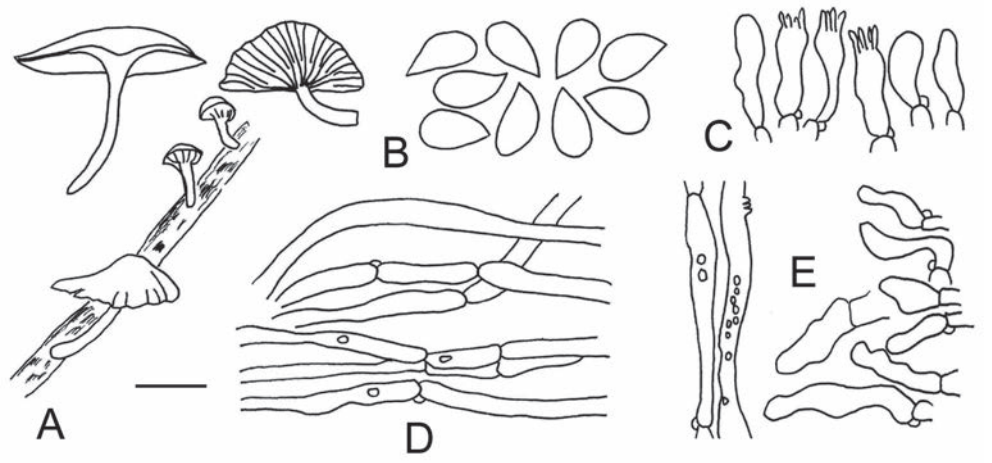

Fig. 42. *Marasmiellus cikanikiensis* Retn. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidia and basidioles. **D.** Pileipellis. **E.** Hyphae of stipe and caulocystidia. Scale bar: B = 10 µm; C–E = 20 µm. Drawn by A. Retnowati from *A.W. Wilson 79.*

1973). *Marasmiellus dealbatus*, described from Cuba, has smaller basidiospores (5.3–8.5 × 2.5–3.7 µm) and grows on dead leaves, culms and roots of Poaceae species, while *M. stenophyllus*, from the neotropics, forms conspicuous cheilocystidia (Singer, 1973).

29. Marasmiellus desjardinii Retn., **sp. nov.** – TYPE: Indonesia, West Java Province, Curug Nangka, Ciapus, north slope of Mount Salak, 11 January 2000, *A.W. Wilson 28* (holotype BO). Mycobank: MB 821721. (Fig. 43, 44)

Pileus 1–10 mm diam., convex when young, becoming plano-convex with age with depressed centre, occasionally umbilicate; margin straight to incurved, then upturned with age, crenate to wavy, translucent striate; surface smooth, moist, hygrophanous, glabrous; white to pale orange (4–5A2–4), turning yellow (2A2). **Context** thin, concolorous with pileus. ***Lamellae*** adnate to arcuate, subdistant (15) with 1–3 series of lamellulae, narrow (up to 1 mm), edge entire; white (1A1) to salmon (6A4–5). ***Stipe*** 2–5 × 0.3–1 mm, central to slightly eccentric, equal, terete, curved, solid becoming hollow, subinsititious to insititious with a small pad or bulb at the base, pruinose to felted, pure white to pale orange (4–5A2–4). ***Odour*** indistinct. ***Taste*** slightly sweet. ***Basidiospores*** 6.4–8(–8.8) × 3.2–4 µm (x_{mr} = 6.8–7.9 × 3.2–3.3, x_{mm} = 7.6 ± 0.6 × 3.28 ± 0.02, Q = 1.8–2.8, Q_{mr} = 2.12–2.43, Q_{mm} = 2.28 ± 0.2, n = 25 spores per 3 specimens), ellipsoid to subfusoid, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** 13.6–24 × 4.6–6.4 µm, clavate, 4-spored. ***Basidioles*** fusoid to clavate. ***Cheilocystidia*** absent. ***Pleurocystidia*** absent. ***Pileipellis*** a cutis; hyphae 2.4–4.8 µm diam., smooth or sparsely diverticulate, non-incrusted, thin-walled, hyaline, inamyloid. ***Pileal trama*** interwoven; hyphae 4–7.2 µm diam., thin-walled, inamyloid. ***Stipe tissue*** monomitic;

Fig. 43. *Marasmiellus desjardinii* Retn. From *D.E. Desjardin 6722*. (Photo: D.E. Desjardin)

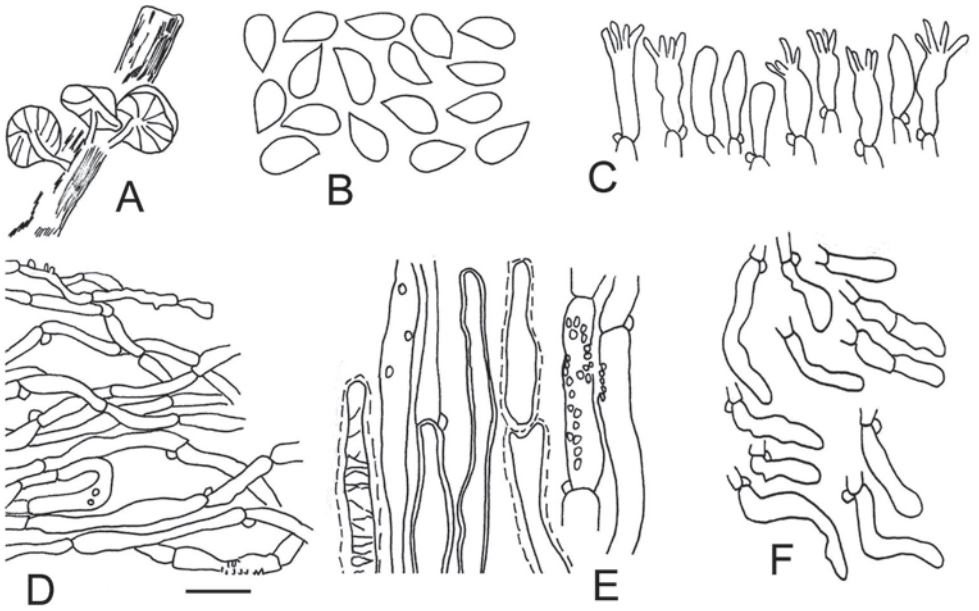

Fig. 44. *Marasmiellus desjardinii* Retn. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidia and basidioles. **D.** Pileipellis. **E.** Hyphae of stipe. **F.** Caulocystidia. Scale bar: B = 10 µm; C–F = 20 µm. Drawn by A. Retnowati from *A.W. Wilson 28.*

hyphae 1.6–13.6 µm diam., thin-walled, parallel, cylindrical, smooth or diverticulate, hyaline, weakly dextrinoid to inamyloid. ***Stipe vesture*** common; caulocystidia 9.6–40 × 4–9.6 µm, clavate to fusoid, cylindrical or irregular in shape, thin-walled, hyaline, inamyloid. ***Clamp connections*** present.

Distribution. Indonesia (Java).

Habit and habitat. Gregarious on twigs, leaves, or sticks of undetermined dicot leaves under *Castanopsis javanica*.

Etymology. The epithet *desjardinii* is in honour of Prof. Dennis E. Desjardin who has given much support to the author to study Agaricales.

Additional specimens examined. INDONESIA: **West Java:** Cibodas Botanical Garden, trail to Mount Gede, 8 Jan 1998, *Desjardin 6722* (BO); Cibodas Botanical Garden, trail to Mount Gede, 2 Jan 1999, *Retnowati 076* (BO).

Notes. *Marasmiellus desjardinii* is distinguished by small, white to pale orangish white basidiocarps with subdistant lamellae, a short, pruinose stipe, basidiospores with a mean of 7.6 × 3.3 µm, no cheilocystidia, a cutis-type pileipellis with smooth or sparsely diverticulate hyphae, numerous smooth caulocystidia, and growth on dicotyledonous leaves and twigs. It shows similarities to *Marasmiellus dealbatus*, but the latter forms conspicuous cheilocystidia and grows on Poaceae.

30. ***Marasmiellus cibodasensis*** Retn., **sp. nov.** – TYPE: Indonesia, West Java Province, Cibodas Botanical Garden, on wood, 16 April 2000, *A. Retnowati 246* (holotype BO). Mycobank: MB 821722. (Fig. 45)

Pileus 4–10 mm diam., convex with flattened disc, slightly umbilicate; margin translucent-striate to sulcate, crenate, incurved; surface pruinose, smooth to slightly wrinkled, dry, not hygrophanous; light brown (6DA) when young, becoming dark brown (6F8) with age. ***Context*** up to 1 mm thick, off-white. ***Lamellae*** adnate, subdistant (12–16), with 1 series of lamellulae, narrow, non-marginate; light brown (6D4). ***Stipe*** 2.5–8 × 0.5–1 mm, central, cylindrical or slightly narrowed at the apex, with a small bulb at the base, insititious, light brown, white-pruinose mostly at the apex; rhizomorphs absent. ***Odour and taste*** indistinct. ***Basidiospores*** 7.2–8 × 4 µm (3 basidiospores observed), ellipsoid, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** unobserved. ***Basidioles*** fusoid to clavate. ***Cheilocystidia*** absent. ***Pleurocystidia*** absent. ***Pileipellis*** a cutis; hyphae 3.2–9.6 µm diam., cylindrical, smooth or with a few diverticula, incrusted, thin- to thick-walled, hyaline, inamyloid. ***Pileal trama*** interwoven; hyphae 2.4–5.6 µm diam., thin- to thick-walled (up to 0.8 µm), inamyloid. ***Stipe tissue*** monomitic; hyphae 2.4–11.2 µm diam., parallel, thin- to thick-walled (up to 1.6 µm), hyaline, inamyloid, some incrusted. ***Stipe vesture*** common; caulocystidia

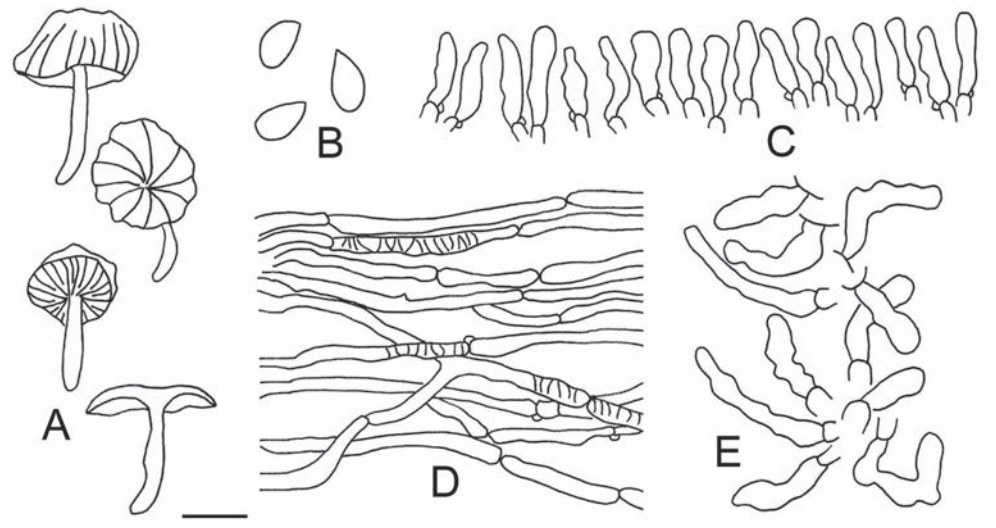

Fig. 45. *Marasmiellus cibodasensis* Retn. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidioles. **D.** Pileipellis. **E.** Caulocystidia. Scale bar: B = 10 µm; C–E = 20 µm. Drawn by A. Retnowati from *A. Retnowati 246*

18.4–62.4 × 4.8–8 µm, fusoid to clavate or sinuous, thin-walled, hyaline. ***Clamp connections*** present.

Distribution. Indonesia (Java).

Habit and habitat. Gregarious on wood.

Etymology. The epithet *cibodasensis* refers to the locality where the type specimen was collected (Cibodas, West Java).

Notes. Distinctive features of *Marasmiellus cibodasensis* include small, light brown basidiocarps with sulcate pileus, subdistant lamellae, an insititious white-pruinose stipe, basidiospores in the range 7.2–8 × 4 µm, no cheilocystidia, a cutis-type pileipellis of incrusted hyphae, abundant sinuous caulocystidia, and lignicolous habit. This species is similar to *Marasmiellus hirtellus* (Berk. & Broome) Pegler, described from Sri Lanka, but the latter forms conspicuous diverticulate cheilocystidia (Pegler, 1977).

31. *Marasmiellus* cf. *stenophyllus* (Mont.) Singer, Sydowia 15: 58 (1961). – *Marasmius stenophyllus* Mont., Ann. Sci. Nat., Bot. 4(1): 116 (1854). – TYPE: French Guyana, on bark, fallen twigs, *Leprieur 1027* (lectotype PC, designated here). (Fig. 46, 47)

Pileus 4–9 mm diam., convex when young, expanding to plano-convex or infundibuliform with age; margin entire to translucent-striate or rugulo-striate to a

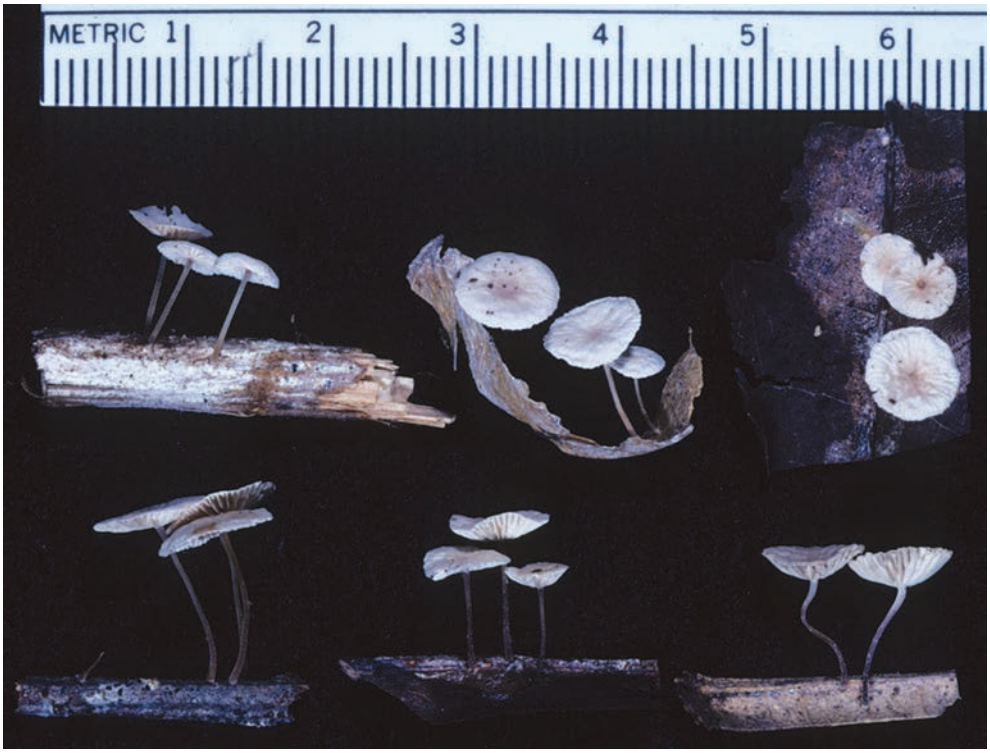

Fig. 46. *Marasmiellus* cf. *stenophyllus* (Mont.) Singer. From *D.E. Desjardin 7065*. (Photo: D.E. Desjardin)

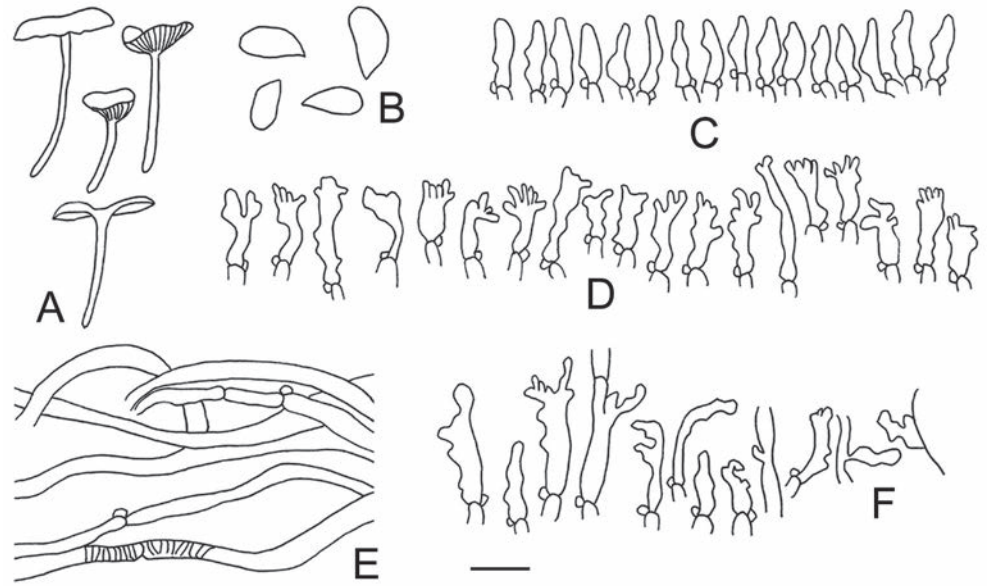

Fig. 47. *Marasmiellus* cf. *stenophyllus* (Mont.) Singer. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidioles. **D.** Cheilocystidia. **E.** Pileipellis. **F.** Caulocystidia. Scale bar: B = 10 µm; C–F = 20 µm. Drawn by A. Retnowati from *D.E. Desjardin 7065.*

smooth disc; surface moist to dry, dull, glabrous or suede-like, hygrophanous; disc pinkish brown to greyish brown (6B-C3), brown (6E7–8) or dark brown (6F7–8), lightening gradually toward margin, which ranges from light fleshy peach (5A2–3) to peach, pink (6A2–3), or off-white. ***Context*** moderately thick, cream. ***Lamellae*** narrowly adnate to adnate or arcuate, close to crowded, with 2–3 series of lamellulae, seldom forked, 0.2–0.5 mm broad, non-marginate, white to buff. ***Stipe*** 8–18 × 0.1–1.5 mm, central, cylindrical, terete or sub-compressed, solid, insititious, dry, glabrous to minutely scaborous at apex or pruinose overall, apex white (4A1–2), base brownish grey (6C3) to milk chocolate brown (7D5–6). ***Odour and taste*** indistinct. ***Basidiospores*** 6.4–9.6 × 3.2 µm (only 4 basidiospores observed), ellipsoid, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** 12–17.6 × 4.8–6.4 µm, clavate, 4-spored. ***Basidioles*** fusoid to clavate. ***Cheilocystidia*** common, composed of *Siccus*-type broom cells; main body 12–34.4 × 4.8–8 µm, fusoid to clavate or irregular in shape, some forked, thin-walled, hyaline; apical setulae 2.4–4.8 × 2.4–4 µm, conical to clavate or cylindrical, thin-walled, hyaline. ***Pleurocystidia*** absent. ***Pileipellis*** a cutis; hyphae 2.4–6.4 µm diam., non-diverticulate, incrusted, thin-walled, inamyloid to weakly dextrinoid, hyaline. ***Pileus trama*** interwoven; hyphae 4.8–5.6 µm diam., thin-walled, inamyloid. ***Stipe tissue*** monomitic; hyphae 2.4–15.6 µm diam., parallel, cylindrical, thin- to thick-walled (up to 0.8 µm), weakly incrusted, inamyloid. ***Stipe vesture*** common; caulocystidia 16–44 × 4.8–5.8 µm, fusoid to clavate or irregular in shape, lobed or with a few outgrowths, thin-walled, inamyloid, hyaline. ***Clamp connections*** present.

Distribution. Indonesia (Java), USA (Florida), French Guyana, and Argentina (Tucumán).

Habit and habitat. Gregarious on various dicot leaves in botanical garden.

Additional specimen examined. INDONESIA: **West Java Province:** Bogor Botanical Garden, 8 Jan 2000, *Desjardin 7065* (BO); Bogor Botanical Garden, 9 Jan 2000, *Wilson 18* (BO).

Notes. The Indonesian material is most similar to *Marasmiellus stenophyllus* (Singer, 1973), but has a darker pileus disc, more lamellae, cheilocystidia with more apical outgrowths, and more caulocystidia (cf. Singer, 1973).

32. *Marasmiellus hirtellus* (Berk. & Broome) Pegler, Kew Bull., Addit. Ser. 6: 130 (1977). – *Marasmius hirtellus* Berk. & Broome, J. Linn. Soc., Bot. 14: 39 (1873). – TYPE: Sri Lanka, Central Prov., Kandy District, Peradeniya, on dead herbaceous plants, November 1867, *Thwaites 102* p.p. (lectotype K, designated here). (Fig. 48)

Pileus 6–12 mm diam., broadly convex, soon applanate to plano-convex; margin entire to eroded, translucent-striate to sulcate, glabrous, becoming felted upon drying, moist, hygrophanous, disc brown (7E8), margin beige (4A2–3). ***Context*** rubbery,

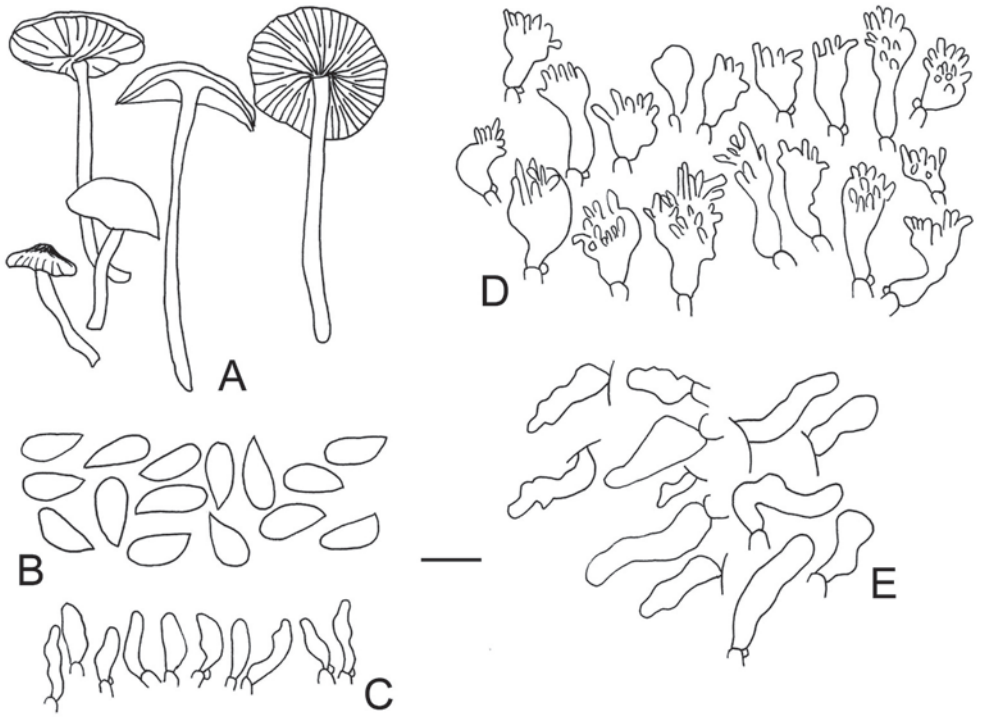

Fig. 48. *Marasmiellus hirtellus* (Berk. & Broome) Pegler. **A.** Basidiomes. **B**. Basidiospores. **C.** Basidioles. **D.** Cheilocystidia. **E.** Caulocystidia. Scale bar: B = 10 µm; C–F = 20 µm. Drawn by A. Retnowati from *A.W. Wilson 122.*

0.5 mm thick, grey brown. ***Lamellae*** adnate, close, with 2–3 series of lamellulae, 2 mm broad, edge entire. ***Stipe*** 9–26 × 0.8–1 mm, central, cylindrical, glabrous to pruinose, solid, pliant, insititious, apex beige/white (4A1–2), base brown (7E–F8). ***Odour and taste*** indistinct. ***Basidiospores*** 8–9.6(–10.4) × (2.4–)3.2–4 µm (x_m = 9.02 ± 0.67 × 3.26 ± 0.32, Q = 2.00–3.33, Q_m = 2.79 ± 0.29, n = 25 spores per 1 specimen), elongate-ellipsoid, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** unobserved. ***Basidioles*** fusoid to clavate. ***Cheilocystidia*** composed of *Siccus*-type broom cells; main body 12–32 × 2.4–8.8 µm, clavate to broadly clavate, subglobose or irregular in shape, thin-walled, hyaline; apical setulae 2.4–8 × 0.8–2.4 µm, conical to clavate, obtuse, thin-walled, hyaline. ***Pleurocystidia*** absent. ***Pileipellis*** a cutis; hyphae 5.6–8.8 µm diam., cylindrical, non-diverticulate, incrusted, hyaline, inamyloid or dextrinoid. ***Pileal trama*** interwoven; hyphae 2.4–8.8 µm diam., thin-walled, hyaline, inamyloid. ***Stipe tissue*** monomitic; hyphae 2.4–10.4 µm diam., cylindrical, parallel, smooth or with a few diverticula, thin- to thick-walled (up to 0.8 µm), inamyloid. ***Stipe vesture*** common; caulocystidia 19.2–48 × 8–12 µm, cylindrical to clavate, thick-walled, hyaline, inamyloid. ***Clamp connections*** present.

Distribution. Indonesia (Bali), Sri Lanka, and East Africa.

Habit and habitat. Gregarious on dicot leaf.

Additional specimen examined. INDONESIA: **Bali Province:** Bedugul, Lake Tamblingan, 20 Jan 2001, *Wilson 122* (SFSU).

Notes. Marasmiellus hirtellus is a pantropical species which has been reported from Sri Lanka (Pegler, 1986) and East Africa (Pegler, 1977). The species has also been treated as *Gymnopus hirtellus* (Berk. & Broome) Desjardin & B.A.Perry (Desjardin & Perry, 2017).

33. *Marasmiellus* aff. *hirtellus* (Berk. & Broome) Pegler, Kew Bull., Addit. Ser. 6: 130 (1977). (Fig. 49, 50)

Pileus 4–10 mm diam., convex, becoming plano-convex to plane-wavy, depressed, dull, moist to dry, subtranslucent, rugulo-striate; disc light brown (7D4), margin pale orangish white (5A2). ***Context*** moderately broad, off-white. ***Lamellae*** adnate, distant, with 2–3 series of lamellulae, moderately broad (<1.5 mm), intervenose and anastomosing with age, pale brownish grey (6C3). ***Stipe*** 4–7 × 0.5 mm, central to eccentric, cylindrical, insititious, tough, terete, curved, appressed pubescent, light brown (7D5), apex paler when young. ***Odour and taste*** indistinct. ***Basidiospores*** (7.2–)8–8.8 × 4–4.8 µm (x_m = 8.29 ± 0.56 × 4.32 ± 0.40, Q = 1.67–2.20, Q_m = 1.93 ± 0.11, n = 25 spores per 1 specimen), ellipsoid to fusoid, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** 16–17.6 × 6.4–8 µm, clavate, 4-spored. ***Basidioles*** fusoid to clavate. ***Cheilocystidia*** common, 20–24 × 4.8–8, fusoid to clavate or irregular in shape, with or without apical diverticula, thin-walled, hyaline. ***Pleurocystidia*** absent. ***Pileipellis*** a cutis; hyphae 3.2–5.6 µm diam., cylindrical, non-diverticulate, thin-walled, hyaline, inamyloid to weakly dextrinoid. ***Pileus trama*** interwoven; hyphae 3.2–5.6 µm diam., thin-walled, inamyloid. ***Stipe tissue*** monomitic; hyphae 2.4–7.2 µm diam., cylindrical, parallel, hyaline, thin-walled, weakly dextrinoid. ***Stipe vesture*** common; caulocystidia 24–32 × 4.8–5.6, fusoid to clavate, thin-walled, hyaline. ***Clamp connections*** present.

Distribution. Indonesia (Java).

Habit and habitat. Gregarious on ginger leaves.

Additional specimen examined. INDONESIA: **West Java Province:** Sukabumi, Parung Kuda, Mount Halimun National Park, loop trail from Cikaniki, c. 1900 m asl, 6 Jan 1999, *Desjardin 6870* (BO).

Notes. The Javanese specimen differs from *Marasmiellus hirtellus* in having a pale orangish white pileus, shorter stipe, and grows on ginger leaves.

Fig. 49. *Marasmiellus* aff. *hirtellus* (Berk. & Broome) Pegler. From D.E. Desjardin 6870. (Photo: D.E. Desjardin)

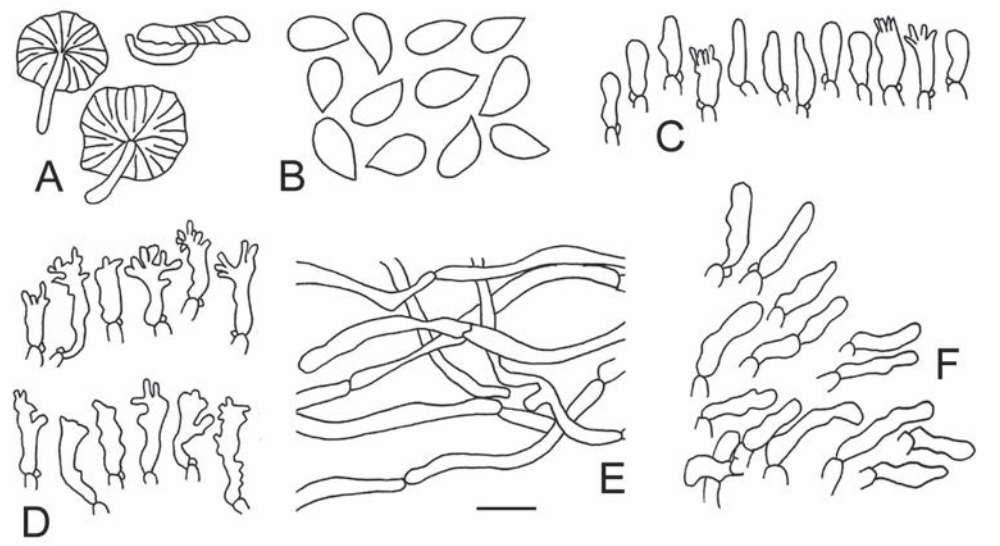

Fig. 50. *Marasmiellus* aff. *hirtellus* (Berk. & Broome) Pegler. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidia and basidioles. **D.** Cheilocystidia. **E.** Pileipellis. **F.** Caulocystidia. Scale bar: B = 10 µm; C–F = 20 µm. Drawn by A. Retnowati from *D.E. Desjardin 6870.*

34. *Marasmiellus javanicus* Retn., **sp. nov.** – TYPE: Indonesia, Java, West Java, Bogor Botanical Gardens, on *Salacca zalacca*, 1 December 2010, *A. Retnowati 811* (holotype BO). Mycobank: MB 821723. (Fig. 51)

Pileus 8–16 mm diam., convex with flattened disc; margin incurved; surface dull, dry, glabrous, strongly hygrophanous, off-white. ***Context*** unobserved. ***Lamellae*** adnate, subdistant, with 2–3 series of lamellulae, moderately broad, off-white. ***Stipe*** 3–5 × 0.1–0.2 mm, central, cylindrical, with a small bulb at the base, insititious, white. ***Odour and taste*** indistinctive. ***Basidiospores*** 7.2–8.8(–9.6) × 4–5.6 µm (x_m = 8.72 ± 0.8 × 4.99 ± 0.3, Q = 1.3–2, Q_m = 1.75 ± 0.1, n = 25 spores per 5 specimens), ellipsoid, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** 23.2–32 × 8–8.8 µm, clavate, 4-spored. ***Basidioles*** clavate. ***Cheilocystidia*** common, composed of *Siccus*-type broom cells; main body 11.2–19.2 × 7.2–9.6 µm, clavate to broadly clavate, thin-walled, hyaline; apical setulae 1.6–3.2 × 1.6 µm, conical, obtuse, thin-walled, hyaline. ***Pleurocystidia*** absent. ***Pileipellis*** a cutis; hyphae 4.8–10.4 µm diam., parallel, smooth or with a few diverticula, non-incrusted, thin-walled, hyaline. ***Pileal trama*** interwoven; hyphae 2.4–8.8 µm diam., thin-walled, hyaline. ***Stipe tissue*** monomitic; hyphae 1.6–9.6 µm diam., cylindrical, parallel, hyaline, thin- to thick-walled (up to 0.8 µm), diverticulate, inamyloid. ***Stipe vesture*** uncommon; caulocystidia 18–30 × 6.4–7.2 µm, fusoid to clavate or irregular in shape, thin-walled, hyaline. ***Clamp connections*** present.

Distribution. Indonesia (Java).

Habit and habitat. Solitary to gregarious on monocot stems (*Costus* L. sp., *Salacca* Reinw. sp.).

Etymology. The epithet *javanicus* refers to island on which the type specimen was collected.

Additional specimens examined. INDONESIA: **West Java Province:** Bogor Botanical Gardens, on *Costus* sp., 1 Dec 2010, *Retnowati 808* (BO), *Retnowati 809-B* (BO), *Retnowati 810* (BO); Bogor Botanical Gardens, on *Salacca* sp., 1 Dec 2010, *Retnowati 813* (BO).

Notes. This species grows on several different monocots plants, such as *Salacca zalacca* (Gaertn.) Voss (Arecaceae) and *Costus dinklagei* K.Schum. (Costaceae). It is characterised by entirely white basidiocarps with *Siccus*-type cheilocystidia, basidiospores with a mean of 8.7 × 5 µm, a cutis-type pileipellis of mostly smooth hyphae, and relatively short, cylindrical to clavate caulocystidia. *Marasmiellus javanicus* is very similar to *Marasmius palmivorus* Sharples, but it has a pileus and stipe that are often pale orange when young, and lightly longer basidiospores (mean 9.7 × 5 µm) (Desjardin & Perry, 2017).

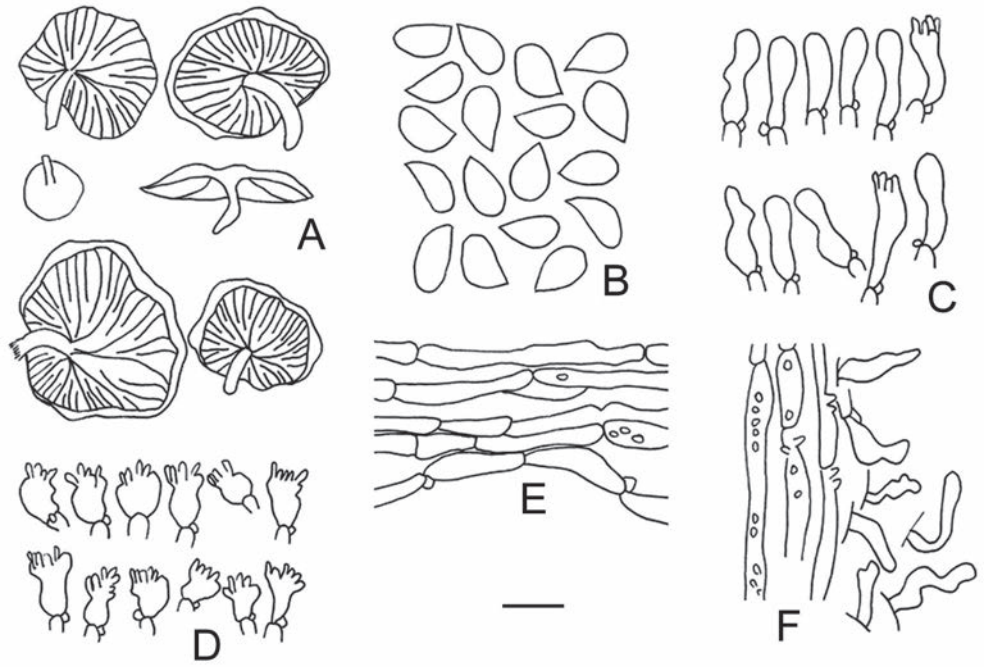

Fig. 51. *Marasmiellus javanicus* Retn. **A.** Basidiomes. **B.** Basidiospores. **C.** Basidia and basidioles. **D.** Cheilocystidia. **E.** Pileipellis. **F.** Hyphae of stipe and caulocystidia. Scale bar: B = 10 µm; C–F = 20 µm. Drawn by A. Retnowati from *A. Retnowati 811*.

Marasmiellus* Section *Stenophylloides Singer, Beih. Nova Hedwigia 44: 73 (1973).

35. *Marasmiellus bisporus* Retn., **sp. nov.** – TYPE: Indonesia, West Java Province, Cibodas Botanical Garden, on wood, 16 April 2000, *A. Retnowati 242* (holotype BO). Mycobank: MB 821724. (Fig. 52)

Pileus 2.5–18 mm diam., convex, margin straight, translucent-striate; surface slightly moist, smooth, glabrous, not hygrophanous, white. ***Context*** moderately broad (up to 3 mm), white. ***Lamellae*** adnate, subdistant (13–16), with 1 series of lamellulae, narrow (up to 1.5 mm), non-marginate, white. ***Stipe*** 2–4 × 0.25–1 mm, eccentric, cylindrical with tapered apex, with a small disc at the base, solid, smooth, minutely pruinose, white with white basal tomentum. ***Taste and odour*** indistinct. ***Basidiospores*** (4–)4.8–5.6(–6.4) × 2.4–3.2 µm (x_m = 4.99 ± 0.48 × 2.82 ± 0.41, Q = 1.5–2.67, Q_m = 1.81 ± 0.30, n = 25 spores per 1 specimen), ellipsoid, smooth, hyaline, inamyloid, thin-walled. ***Basidia*** 16–18.4 × 3.2–4 µm, clavate, 2-spored. ***Basidioles*** fusoid to clavate. ***Cheilocystidia*** common, versiform; main body 20–34.4 × 9.2–14.4 µm, clavate to fusoid, ventricose or irregular in shape, with or without apical diverticula, thin-walled, hyaline, inamyloid. ***Pleurocystidia*** absent. ***Pileipellis*** composed of a *Rameales*-structure and setae; terminal cells 14.4–32.8 × 9.6–16 µm, clavate or irregular in shape,

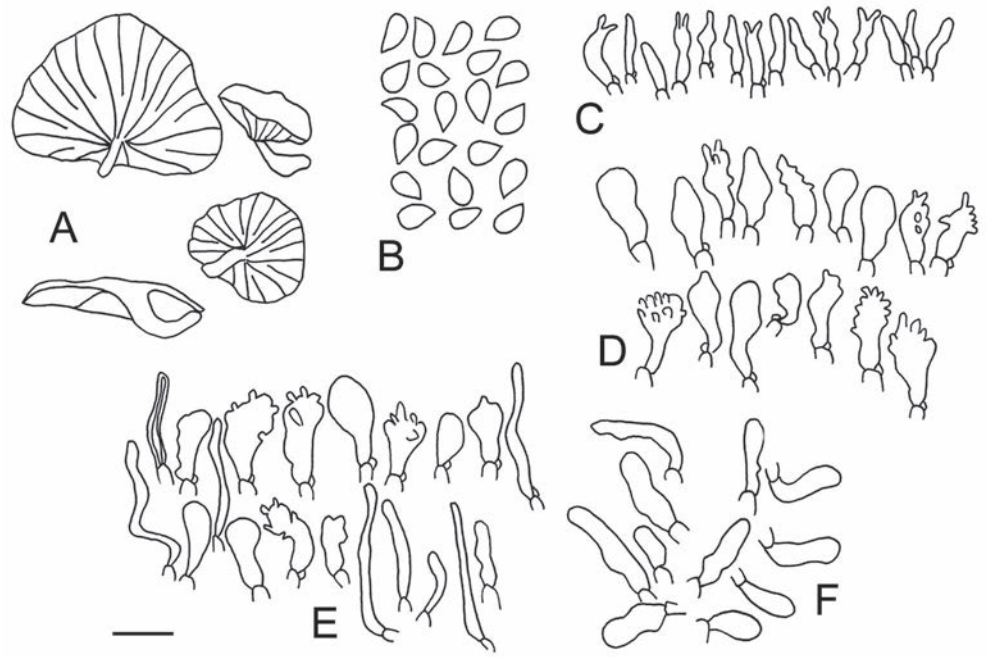

Fig. 52. *Marasmiellus bisporus* Retn. **A.** Basidiomes. **B**. Basidiospores. **C.** Basidia and basidioles. **D.** Cheilocystidia. **E.** Pileipellis with setae. **F.** Caulocystidia. Scale bar: B = 10 µm; C–F = 20 µm. Drawn by A. Retnowati from *A. Retnowati 242.*

smooth or diverticulate, thin-walled, hyaline, inamyloid; setae numerous, 17.6–64 × 2.4–3.2 µm, cylindrical to slender fusoid, thin- to thick-walled (up to 1.6 µm). ***Pileal trama*** not observed. ***Stipe tissue*** monomitic; hyphae 4–17.6 µm diam., cylindrical, parallel, thin-walled, hyaline, inamyloid to weakly dextrinoid. ***Stipe vesture*** common; caulocystidia 16–37.6 × 4–6.4 µm, fusoid to clavate, thin-walled, hyaline. ***Clamp connections*** present.

Distribution. Indonesia (Java).

Habit and habitat. Gregarious on wood.

Etymology. The epithet *bisporus* refers to the 2-spored basidia.

Notes. Marasmiellus bisporus is distinguished by white basidiocarps with convex, translucent-striate pileus, subdistant lamellae, a short (2–4 mm), minutely pruinose stipe, small basidiospores (mean 5 × 2.8 µm) produced on 2-spored basidia, versiform cheilocystidia, a *Rameales*-type pileipellis with numerous setae, clavate caulocystidia, and lignicolous habit. The presence of pileosetae suggest placement in *Marasmiellus* sect. *Stenophylloides*, where the Javanese specimen is unique because of the very small basidiospores and 2-spored basidia (Singer, 1973; Pegler, 1977, 1983, 1986; Antonín & Noordeloos, 1993).

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