# Four new species of *Marasmius* section *Globulares* from Northern Thailand

**Wannathes**, **N**.[1], **Desjardin**, **D**.**E**.[2*] **and Lumyong**, **S**.[1]

[1]Department of Biology, Faculty of Science, Chiang Mai University, Chiang Mai 50200, Thailand
[2]Department of Biology, San Francisco State University, 1600 Holloway Ave., San Francisco, California 94132, USA

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Four new species of *Marasmius* belonging to section *Globulares*, viz., *Marasmius grandiviridis*, *M. laticlavatus*, *M. mokfaensis* and *M. pseudopurpureostriatus*, are described, illustrated, and compared with phenetically similar taxa.

**Key words**: agaricales, basidiomycetes, fungi, taxonomy

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*Corresponding author: Dennis E Desjardin; e-mail: ded@sfsu.edu

## Introduction

This paper is part of a series dealing with the macrofungi of northern Thailand (Le *et al*., 2007a,b). The genus *Marasmius* constitutes one of the more commonly collected genera of litter-decomposing agarics in Southeast Asian forests. Several preliminary monographs have been published on the taxonomy and distribution of *Marasmius* from Malaysia (Corner, 1996; Tan *et al*., 2007) and Indonesia (Desjardin *et al*., 2000), although only limited accounts of *Marasmius* from Thailand have been documented (Desjardin *et al*., 2004; Wannathes *et al*., 2004; Wannathes *et al*., 2007). During the course of developing a monograph of Thai *Marasmius* based on extensive new fieldwork and supported by morphological and molecular datasets, we encountered numerous new species, of which four are described herein. In this paper we also provided the GenBank accession numbers (Table 1) of the ITS sequences of each new species. Molecular phylogenetic reconstructions utilizing these sequences will be published elsewhere.

## Materials and methods

Color terms and notations in parentheses are those of Kornerup and Wanscher (1978). All measurements and colors reported for microscopic features were observed from dried material rehydrated in 100% ethanol followed by distilled water, 3% potassium hydroxide (KOH) or Melzer's reagent. The terms used to describe lamellae spacing refer to the number of lamellae that reach from the stipe to the pileus margin and do not include the lamellulae, whose spacing is indicated by the number of series present. Spore statistics include: $x_m$, the arithmetic mean of the spore length by spore width (± standard deviation) for n spores measured in a single specimen; $x_{mr}$, the range of spore means, and $x_{mm}$, the mean of spore means (± SD) when more than one specimen is available; Q, the quotient of spore length by spore width in any one spore, indicated as a range of variation in n spores measured; $Q_m$, the mean of Q-values in a single specimen; $Q_{mr}$, the range of $Q_m$ values and $Q_{mm}$, the mean of $Q_m$ values where more than one specimen is available; n, the number of spores measured per specimen; s, the

**Table 1**. GenBank accession numbers of new species of Thai *Marasmius*.

| Species | Collection number | MycoBank number | GenBank accession number |
|---|---|---|---|
| *Marasmius grandiviridis* | NW152 | MB511932 | EU643514 |
| *Marasmius grandiviridis* | NW349 | MB511932 | EU643515 |
| *Marasmius laticlavatus* | NW231 | MB511933 | EU643510 |
| *Marasmius laticlavatus* | NW293 | MB511933 | EU643512 |
| *Marasmius laticlavatus* | NW412 | MB511933 | EU643511 |
| *Marasmius mokfaensis* | DED7726 | MB511934 | EU643516 |
| *Marasmius mokfaensis* | NW020 | MB511934 | EU643517 |
| *Marasmius pseudopurpureostriatus* | NW286 | MB511935 | EU643513 |

number of specimens involved. Specimens are deposited in the mycological herbarium at Chiang Mai University (CMU), and the H.D. Thiers Herbarium at San Francisco State University (SFSU).

## Results

***Marasmius grandiviridis*** Wannathes, Desjardin & Lumyong **sp**. **nov**. (Figs1, 5-9)

MycoBank: MB511932.

*Etymology*: '*grandis*' = large; '*viridis*' = green; referring to the size and colour of the basidiomes.

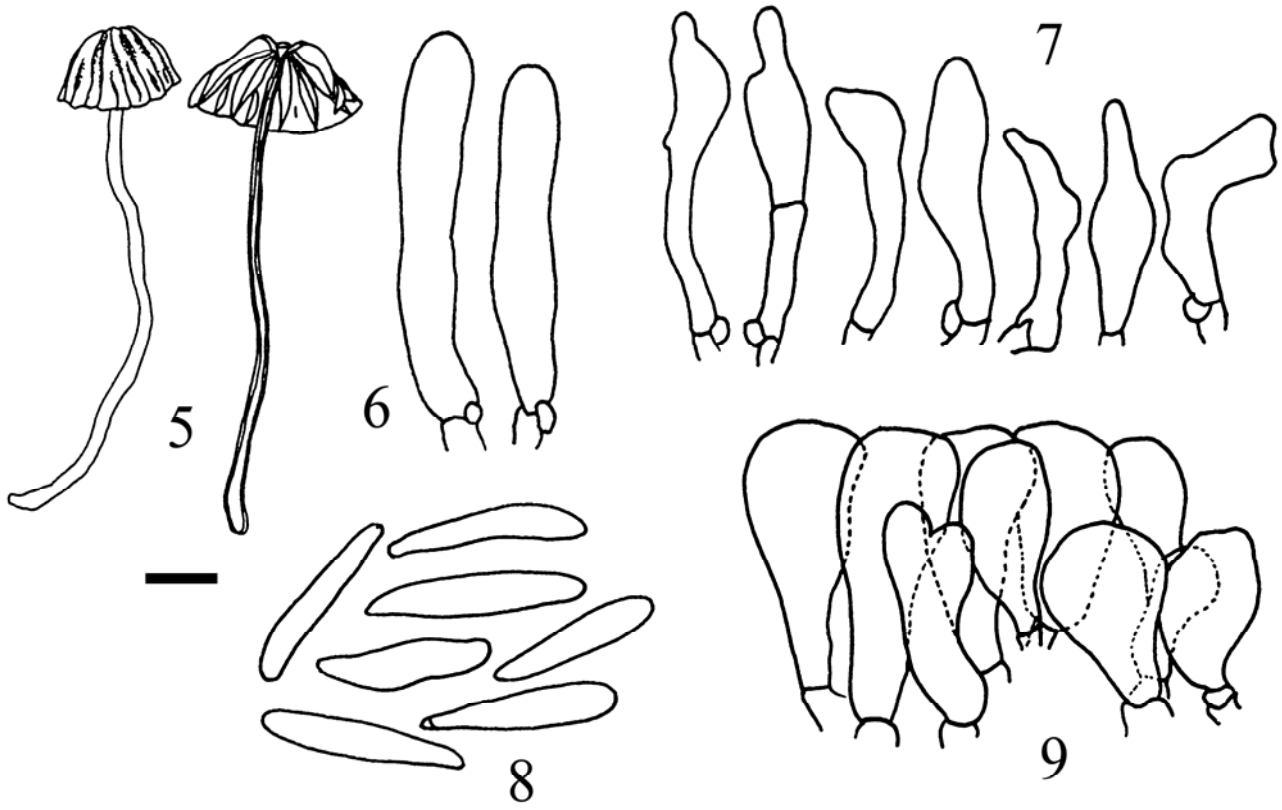
*Pileus* 37–88 mm diametro, conicus usque hemisphaericus ubi iuvenis, late conicus cum depressione exigua ubi vetus, glaber, plicatus, flavovirens cum plicis olivaceis. *Contextus* flavovirens, tenuis. *Lamellae* anguste adnatae, distantes (10–13) cum 1 serie lamellularum, latae (2–9 mm), flavovirentes, haud marginatae, haud intervenosae. *Stipes* 133–180 × 3–7 mm, centralis, cylindraceus, cavus, glaber, haud insititius, apice flavo-spadiceo, basi brunneo-viridi usque brunnea. *Odor saporque* non propria. *Basidiosporae* (23–) 26–30 × 4–5 µm, clavatae usque subfusoideae, saepe oblique curvae, laeves, hyalinae, inamyloideae, tenuitunicatae. *Basidiolae* cylindraceae usque clavatae. *Cheilocystidia* abundantia, sterilia ad marginem lamellarum, 18–43 × 5–12 µm, irregulariter cylindracea usque clavata, lageniformia cum mucrone lato, raro furcata, hyalina, inamyloidea, tenuitunicata. *Pleurocystidia* nulla. *Pilepellis* hymeniformis, cellulis typi *Globularis*, 15–42 × 11–15 µm, clavatis, late clavatis usque pyriformibus, hyalinis usque flavidis, inamyloideis, tenuitunicatis. *Trama pilei* intertexta, dextrinoidea. *Trama lamellarum* regularis usque intertexta, hyphis (3–) 5–10 µm diam., cylindraceis usque inflates, laevibus, hyalinis, leniter dextrinoideis usque inamyloideis, tenuitunicatis, haud gelatinosis. *Stipitipellis* subparallelus, hyphis 4–8 (–10) µm diam., cylindraceis, flavis usque viridi-flavis, laevibus, dextrinoideis, crassetunicatis (usque ad 2 µm), haud gelatinosis. *Trama stipitis* parallela, hyphis 4–12 µm diam., cylindraceis, laevibus, hyalinis, dextrinoideis, tenuitunicatis, haud gelatinosis. *Caulocystidia* nulla. *Fibulae* praesentes in omnibus texturis. Sparsus usque gregarius in folia plantarum dicotyledonearum.

***Holotypus***: Thailand, Chiang Mai Province, Doi Inthanon National Park, junction of Hwy 1009 and road to Mae Chem, N19°31.58', E 98°29.64', 1700 m alt., 10 June 2004, N. Wannathes 152 (CMU).

*Pileus* 37–88 mm diam., conical to hemispherical when young, broadly conical with a slight depression in age, glabrous, dull, plicate, yellowish green with olive green plicae. *Context* yellowish green, thin. *Lamellae* narrowly adnate, distant (10–13) with 1 series of lamellulae, broad (2–9 mm), yellowish green, non-marginate, non-intervenose. *Stipe* 133–180 × 3–7 mm, central, cylindrical, hollow, glabrous, non-insititious, apex yellowish light brown, base brownish green to brown. *Odor* and *taste* not distinctive.

*Basidiospores* (23–) 26–30 × 4–5 µm [$x_m$ = 26.7 ± 1.9 × 4.4 ± 0.5 µm, Q = 4.6–7.5, $Q_m$ = 6.1, n = 25 spores, s = 1 specimen], clavate to subfusoid, often curved in profile, smooth, hyaline, inamyloid, thin-walled. *Basidia* not observed. *Basidioles* cylindrical to clavate. *Cheilocystidia* abundant, lamellae edge sterile, 18–43 × 5–12 µm, irregularly cylindrical to clavate, lageniform with a broad mucro, rarely forked, hyaline, inamyloid, thin-walled. *Pleurocystidia* absent. *Pileipellis* a hymeniform layer of *Globulares*-type cells, 15–42 × 11–15 µm, clavate to broadly clavate or pyriform, hyaline to pale yellow, inamyloid, thin-walled. *Pileus trama* interwoven, dextrinoid. *Lamellae trama* regular to interwoven, hyphae (3–) 5–10 µm diam., cylindrical to inflated, smooth, hyaline, weakly dextrinoid to inamyloid, thin-walled, non-gelatinous. *Stipitipellis* subparallel, hyphae 4–8 (–10) µm diam., cylindrical, yellow to greenish yellow, smooth, weakly dextrinoid to dextrinoid, thick-walled (up to2 µm), non-gelatinous. *Stipe trama* parallel, hyphae 4–12 µm diam., cylindrical, hyaline, smooth, dextrinoid, thin-walled, non-


**Figs 1-4**. Colour photos of Thai *Marasmius*. **1** *M. grandiviridis* (N.Wannathes 152). **2** *M. laticlavatus* (N. Wannathes 412). **3** *M. mokfaensis* (D.E.Desjardin 7726). **4** *M. pseudopurpureostriatus* (N. Wannathes 286). Scale bar = 20 mm.




**Figs 5-9**. *Marasmius grandiviridis* (N. Wannathes152). **5** Basidiomes. **6** Basidioles. **7** Cheilocystidia. **8** Basidiospores. **9** Pileipellis. Scale bar: 5 = 10 mm, 6-9 = 10 µm

gelatinous. *Caulocystidia* absent. *Clamp connections* present in all tissues.

*Habit, habitat and known distribution*. Scattered to gregarious on dicotyledonous leaves; Northern Thailand.

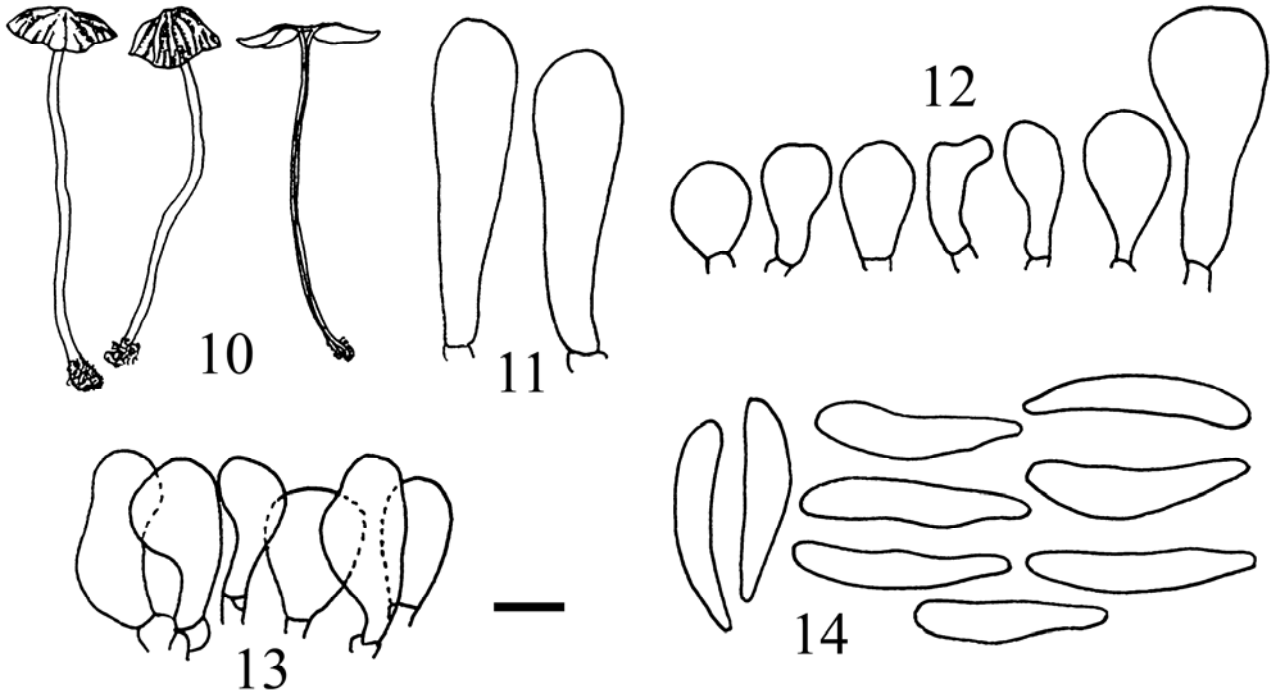
*Material examined*. THAILAND, Chiang Mai Province, Doi Inthanon National Park, junction of Hwy 1009 and road to Mae Chem, N19°31.58', E 98°29.64', 1700 m alt.,10 June 2004, N. Wannathes 152 (Holotype: CMU; Isotype: SFSU); same location, 27 June 2005, N. Wannathes 349 (CMU, SFSU).

*Commentary*. Distinctive features of *M. grandiviridis* include a large, plicate pileus (37–88 mm diam) colored yellowish green with darker olive-green plicae, yellowish green, distant (10–13) lamellae, a large (133–180 × 3–7 mm), yellow to brownish green, glabrous stipe, clavate basidiospores with mean 26.7 × 4.4 µm, irregularly clavate to lageniform-mucronate cheilocystidia, and an absence of pleurocystidia and caulocystidia. It is similar to *M. viridis* Desjardin & E. Horak, described from Papua New Guinea, but the latter differs in forming smaller basidiomes (pilei 10–15 mm diam, stipe 30–50 × 1 mm) with more lamellae (12–16), a dark reddish-brown stipe, smaller basidiospores (20–25 × 4–5 µm) and cheilocystidia that are more regularly clavate (Desjardin & Horak 1997).

***Marasmius laticlavatus*** Wannathes, Desjardin & S. Lumyong **sp**. **nov**. (Figs 2, 10-14) MycoBank: MB511933.

*Etymology*: '*latus*' = broad; '*clavatus*' = clavate; referring to the broadly clavate cheilocystidia.

*Pileus* 15–19 (–33) mm diametro, convexus, plano-convexus usque plano-infundibuliformis cum umbone rugoso, glaber, sulcatus usque plicatus, disco brunneo, margine flavo-cinereo usque cinereo-cremeo. *Contextus* cinereo-flavus, tenuis. *Lamellae* annexae usque adnatae, distantes (10–13) cum 1–2 serie lamellularum, latae (2–6 mm), bubalinae usque cremeae vel albae, haud marginatae, haud intervenosae. *Stipes* 30–80 × 1–2 mm, centralis, cylindraceus cum subbulbo angusto ad basim, cavus, glaber, apice cinereo-cremeo usque bubalino, basi brunneo-aurantiaca usque rubro-brunnea. *Odor saporque* non propria. *Basidiosporae* 26–35 × 5–6 (–7) µm, clavatae usque subfusoideae, saepe oblique curvae, hyalinae, inamyloideae, tenuitunicatae. *Basidiolae* cylindraceae usque clavatae. *Cheilocystidia* abundantia, 13–30 × 9–16 µm, clavata usque late clavata, hyalina, inamyloidea, tenuitunicata. *Pleurocystidia* nulla. *Pileipellis* hymeniformis, cellulis typi *Globularis*, 15–33 × 9–17 (–23) µm, late clavatis usque pyriformibus, hyalinis, inamyloideis, tenuitunicatis. *Trama pilei* intertexta, dextrinoidea. *Trama lamellarum* intertexta, hyphis 3–10 µm diam., cylindraceis, laevibus, hyalinis, dextrinoideis,




**Figs 10-14**. *Marasmius laticlavatus* (N. Wannathes 231). **10** Basidiomes. **11** Basidioles. **12** Cheilocystidia. **13** Pileipellis. **14** Basidiospores. Scale bar: 10 = 10 mm, 11-14 = 10 µm.

tenuitunicatis, haud gelatinosis. *Stipitipellis* subparallelus, hyphis 3–8 µm diam., cylindraceis, flavis usque pallide brunneis, laevibus, dextrinoideis, crassitunicatis (usque ad 2 µm), haud gelatinosis. *Trama stipitis* parallela, hyphis 5–10 µm diam., cylindraceis, laevibus, hyalinis, leniter dextrinoideis, tenuitunicatis, haud gelatinosis. *Caulocystidia* nulla. *Fibulae* praesentes in omnibus texturis. Sparsus usque gregarius in folia de bambusae vel de plantis dicotyledoneis.

***Holotypus***: Thailand, Chiang Mai Province, Mae Rim District, Huai Tung Taow Reservoir, 23 July 2004, N.Wannathes 231 (CMU).

*Pileus* 15–19 (–33) mm diam., convex to plano-convex or plano-infundibuliform, with a wrinkled umbo, dull, glabrous, sulcate to plicate, disc brown, margin yellowish grey to greyish cream. *Context* greyish yellow, thin. *Lamellae* adnexed to adnate, distant (10–13) with 1–2 series of lamellulae, broad (2–6 mm), buff to cream or white, non-marginate, non-intervenose. *Stipe* 30–80 × 1–2 mm, central, cylindrical with a narrow subbulbous at base, hollow, glabrous, apex yellowish grey to buff, base brownish orange to reddish brown. *Odor* and *taste* not distinctive.

*Basidiospores* 26–35 × 5–6 (–7) µm [$x_{mr}$ = 28.7–32 × 5.1–6 µm, $x_{mm}$ = 30.4 ± 1.9 × 5.6 ± 0.5 µm, Q = 4.1–6.9, $Q_{mr}$ = 5.0–6.0, $Q_{mm}$ = 5.5 ± 0.5, n = 25 spores, s = 4 specimens], clavate to subfusoid, often curved in profile, hyaline, inamyloid, thin-walled. *Basidia* not observed. *Basidioles* cylindrical to clavate. *Cheilocystidia* abundant, 13–30 × 9–16 µm, clavate to broadly clavate, hyaline, inamyloid, thin-walled. *Pleurocystidia* absent. *Pileipellis* a hymeniform layer of *Globulares*-type cells, 15–33 × 9–17 (–23) µm, broadly clavate to pyriform, hyaline, inamyloid, thin-walled. *Pileus trama* interwoven, dextrinoid. *Lamellae trama* interwoven, hyphae 3–10 µm diam., cylindrical, smooth, hyaline, weakly dextrinoid to dextrinoid, thin-walled, non-gelatinous. *Stipitipellis* subparallel, hyphae 3–8 µm diam., cylindrical, smooth, yellow to light brown, dextrinoid, thick-walled (up to 2 µm), non-gelatinous. *Stipe trama* parallel, hyphae 5–10 µm diam., cylindrical, smooth, hyaline, weakly dextrinoid, thin-walled, non-gelatinous. *Caulocystidia* absent. *Clamp connections* present in all tissues.

*Habit, habitat and known distribution*. Scattered to gregarious on bamboo or dicotyledonous leaves, Northern Thailand.

*Material examined*. THAILAND, Chiang Mai Province, 22 km marker on Hwy 1095, N19°07.57', E98°45.65', 750 m alt., 5 July 2004, T. Y. Shin 312 (CMU, SFSU); Chiang Mai Province, Mae Rim District, Huai Tung Taow Reservoir, 23 July 2004, N.Wannathes 231(Holotype: CMU; Isotype: SFSU); Chiang Rai

Province, Muang District, Pong Prabath Waterfall, 11 June 2005, N.Wannathes 293(CMU, SFSU); Phrae Province, Muang District, Cherng Thong Waterfall, 16 August 2005, N. Wannathes 412 (CMU, SFSU).

*Commentary*. The new Thai species is characterized by the following features: relatively small, plicate pilei with brown disc and pallid greyish cream margin; distant, cream-colored lamellae; a thin, glabrous stipe colored yellowish grey on the apex and reddish brown at the base; large clavate basidiospores with mean 30.4 × 5.6 µm and mean Q = 5.5; broadly clavate cheilocystidia; and an absence of pleurocystidia and caulocystidia. *Marasmius laticlavatus* is phenetically most similar to several pale-colored African species that also lack pleurocystidia, as recently documented by Antonín (2007). *Marasmius camerunensis* Antonín & Mossebo differs in forming much larger pilei (40–70 mm diam.) with violaceous brown disc, broader lamellae (8–10 mm), a much thicker stipe (4–6 mm), smaller basidiospores (21–30 × 5.5–6.5 µm with mean Q = 4.2), and a lignicolous habit. *Marasmius tshopoensis* Antonín differs in forming larger pilei (up to 60 mm diam.), strongly intervenose lamellae, smaller basidiospores (19–26 × 4.8–6 µm with mean Q = 4.3), and variably shaped cheilocystidia some of which may be irregularly lobed, but not consistently broadly clavate. *Marasmius brunneolus* (Beeli) Singer differs in forming larger pilei (30–80 mm diam.) that are more evenly pigmented brown to reddish brown or striped white, a larger stipe (70–180 × 3–6 mm), and smaller basidiospores (15.5–25.5 × 3.8–5.4 µm with mean Q = 4.5). There are no Asian species similar to *M. laticlavatus.*

***Marasmius mokfaensis*** Wannathes, Desjardin & Lumyong **sp**. **nov**. (Figs 3, 15-19) MycoBank: MB511934.

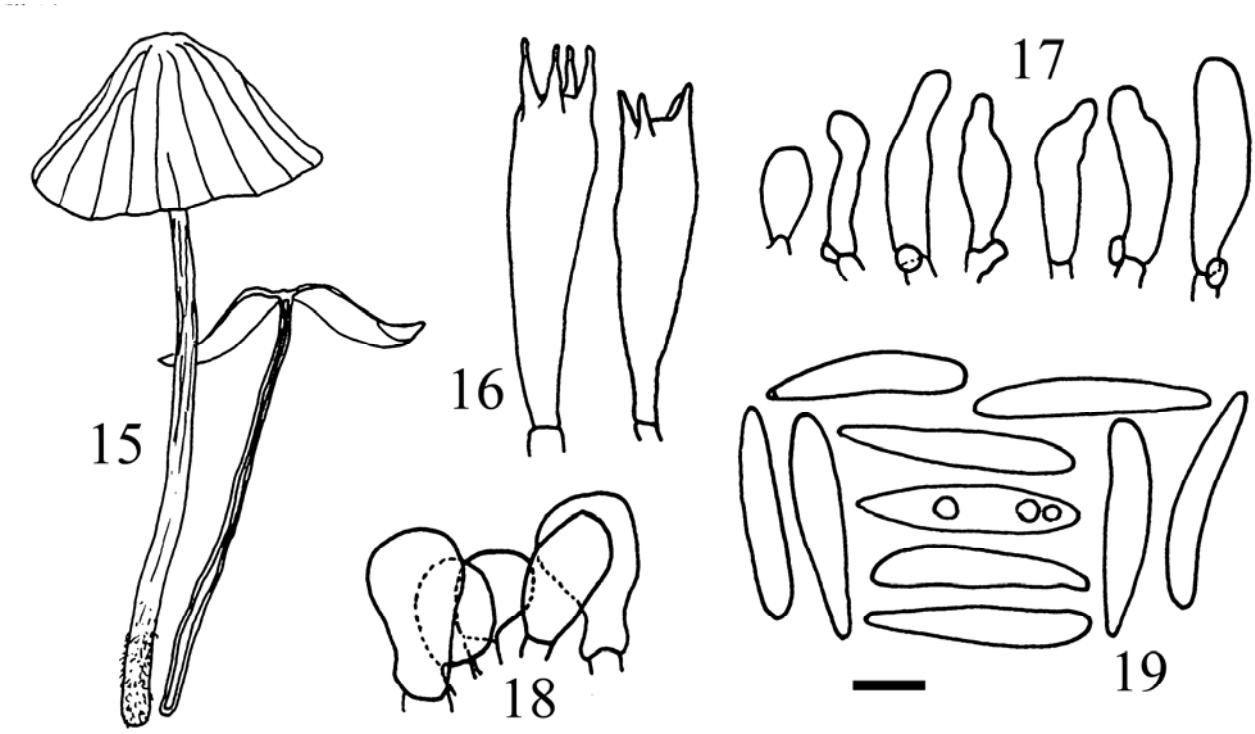
*Etymology*. '*mokfa*' = referring to Mokfa Waterfall where the holotype specimen was collected.

*Pileus* 30–90 mm diametro, obtuse conicus ubi iuvenis, convexus usque campanulatus ubi vetus, glaber, siccus, ruguloso-plicatus, hygrophanus, ubique atro-azureus usque purpureo-cinereus ubi iuvenis, pallide cinereo-brunneus cum porcis pallidis ubi vetus. *Contextus* pallide cretaceus usque albus, tenuis. *Lamellae* subliberae usque adnexae, distantes (13–18) cum 0–1 serie lamellularum, latae (4–10 mm), cretaceae vel cinereae usque cinereo-brunneae, haud marginatae, haud intervenosae. *Stipes* 85–180 × 3–7 mm, centralis, cylindraceus cum basi anguste clavata, tortuosus, fibrosus, cavus, glaber, basi tomentosa, apice cinereo-violaceo usque cretaceo, basi cinereo-flava usque brunneo-cinerea. *Odor* leviter raphanoideus. *Sapor* ingratus. *Basidiosporae* 27–33 × 5–6 µm, clavatae usque subfusoideae, saepe oblique curvae, hyalinae, inamyloideae, tenuitunicatae. *Basidia* 41–45 × 11–12 µm, clavata, 4-spora. *Basidiolae* cylindraceae usque clavatae. *Cheilocystidia* vulgaria, 15–33 × (3–) 5–11 (–17) µm, irregulariter clavata usque ventricosa, hyalina, inamyloidea, tenuitunicata. *Pleurocystidia* nulla. *Pileipellis* hymeniformis, cellulis typi *Globularis*, 11–31 (–39) × 7–15 µm, clavatis, late clavatis usque pyriformibus, hyalinis, inamyloideis, tenuitunicatis. *Trama pilei* intertexta, dextrinoidea. *Trama lamellarum* intertexta, hyphis 4–8 µm diam., cylindraceis usque inflatis, laevibus, hyalinis, dextrinoideis, tenuitunicatis, haud gelatinosis. *Stipitipellis* parallelus, hyphis 5–15 µm diam., cylindraceis, brunneis usque viridi-fuscis, laevibus, inamyloideis usque leniter dextrinoideis, tenuitunicatis usque crassetunicatis (usque ad 1 µm), haud gelatinosis. *Trama stipitis* parallela, hyphis 3–8 µm diam., cylindraceis, laevibus, hyalinis, dextrinoideis, tenuitunicatis, haud gelatinosis. *Caulocystidia* nulla. *Fibulae* praesentes in omnibus texturis. Solitarius in folia de bambusae de plantis dicotyledoneis.

***Holotypus***: Thailand, Chiang Mai Province, Doi Suthep-Pui National Park, Mokfa Waterfall, on Hwy 1095, N19° 6.581', E98°46.353', 1014 m alt., 29 June 2004, D.E. Desjardin 7726 (CMU).

*Pileus* 30–90 mm diam., obtusely conical when young, convex to campanulate in age, dull, dry, glabrous, rugulose-plicate, hygrophanous, blackish blue (19F4-6) to purplish grey (14F3-4) or dark brown to dark greyish brown (7-9F3-5) overall when young, becoming greyish magenta (14D3) to pale brownish grey (8-9D-E3) on disc and plicae in age with the ridges paler to pale greyish brown (10E3) or pale violet brown. *Context* pale greyish white to white, thin. *Lamellae* subfree to adnexed, distant (13–18) with 0–1 series of lamellulae, broad (4–10 mm), greyish white (9B1) to grey (9C-D2), greyish magenta (14D3) or brownish grey (8D2), non-marginate, non-intervenose. *Stipe* 85–180 × 3–7 mm, central, cylindrical with a narrowly clavate base, twisted-fibrous, hollow, glabrous, base tomentose, apex greyish violet (17D4-6) to greyish white, base greyish yellow (4B3-4) to brownish grey (6-8D2-3); stipe context yellow in age. *Odor* faintly raphanoid to rancid. *Taste* unpleasant.

*Basidiospores* 27–33 × 5–6 µm [$x_{mr}$ = 28.6–30.7 × 5.0–5.6 µm, $x_{mm}$ = 30.0 ± 1.0 × 5.3 ± 0.3 µm, Q = 4.7–6.6, $Q_{mr}$ = 5.5–5.9, $Q_{mm}$ = 5.7 ± 0.2, n = 25 spores, s = 4 specimens], clavate to subfusoid, often curved in profile,




**Figs 15-19**. *Marasmius mokfaensis* (D.E. Desjardin 7726). **15** Basidiomes. **16** Basidia. **17** Cheilocystidia. **18** Pileipellis. **19** Basidiospores. Scale bar: 15 = 10 mm, 16-19 = 10 µm.

hyaline, inamyloid, thin-walled. *Basidia* 41–45 × 11–12 µm, clavate, 4-spored. *Basidioles* cylindrical to clavate. *Cheilocystidia* common, 15–33 × (3–) 5–11 (–17) µm, irregularly clavate to ventricose, hyaline, inamyloid, thin-walled. *Pleurocystidia* absent. *Pileipellis* a hymeniform layer of *Globulares*-type cells, 11–31 (–39) × 7–15 µm, clavate to broadly clavate or pyriform, hyaline, inamyloid, thin-walled. *Pileus trama* interwoven, dextrinoid. *Lamellae trama* interwoven, hyphae 4–8 µm diam., cylindrical to inflated, smooth, hyaline, dextrinoid, thin-walled, non-gelatinous. *Stipitipellis* parallel, hyphae 5–15 µm diam., cylindrical, smooth, brown to dark greenish brown, inamyloid to weakly dextrinoid, thin- to thick-walled (up to 1 µm), non-gelatinous. *Stipe trama* parallel, hyphae 3–8 µm diam., cylindrical, smooth, hyaline, dextrinoid, thin-walled, non-gelatinous. *Caulocystidia* absent. *Clamp connections* present in all tissues.

*Habit, habitat and known distribution*. Solitary on bamboo and dicotyledonous leaves, Northern Thailand.

*Material examined*. THAILAND, Chiang Mai Province, Doi Suthep-Pui National Park, Mokfa Waterfall, on Hwy 1095, N19° 6.581', E98°46.353', 1014 m alt., 28 June 2003, D. E. Desjardin 7592 (CMU, SFSU); same location, 3 July 2003, D. E. Desjardin 7606 (CMU, SFSU); same location, 8 July 2003, N. Wannathes 020 (CMU, SFSU); same location, 29 June 2004, D.E. Desjardin 7726 (Holotype: CMU; Isotype: SFSU); same location, 25 June 2005, N. Wannathes 328 (CMU, SFSU).

*Commentary*. Diagnostic features of *Marasmius mokfaensis* include: a very large, plicate pileus 30–90 mm diam., colored blackish blue to purplish grey with paler ridges; distant, broad greyish brown lamellae; a large (85–180 × 3–7 mm), pale colored stipe; clavate basidiospores with mean 30 x 5.3 µm and mean Q = 5.7; irregularly clavate to ventricose cheilocystidia, and an absence of pleurocystidia and caulocystidia. This is the largest known *Marasmius* in Thailand and is phenetically similar to two large African species. *Marasmius zenkeri* Henn. differs in forming pilei with more lilac-violet to lilac-pink pilei, smaller basidiospores (15.5–27 × 4.2–5.6 µm with mean Q = 4.0), and more consistently clavate cheilocystidia (Antonín 2007). *Marasmius bekolacongoli* Beeli differs in forming pilei that in age have dull red to greyish red disc and sulcae with yellowish white to lemon yellow ridges, smaller basidiospores (17.5–26 × 3.8–5.4 µm with mean Q = 4.8), and more consistently clavate

cheilocystidia (Antonín 2007). There are no Asian species similar to *M. laticlavatus*.

***Marasmius pseudopurpureostriatus***
Wannathes, Desjardin & Lumyong **sp**. **nov**.
(Figs 4, 20-24)

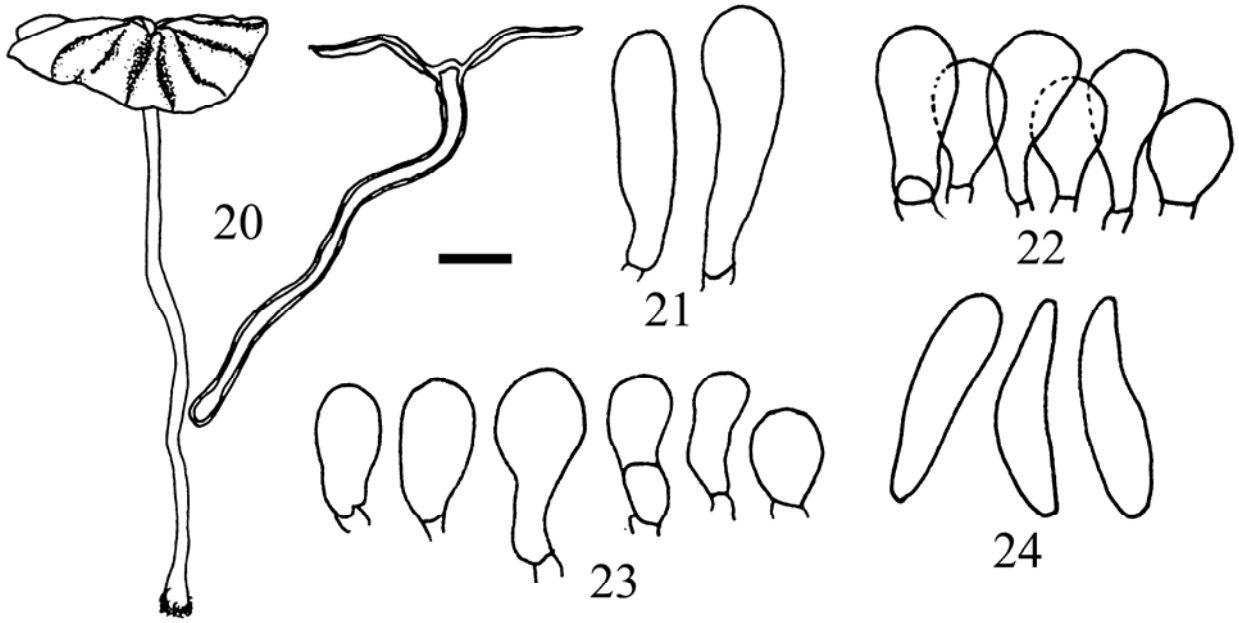
MycoBank: MB511935.

*Etymology*: '*pseudo*' = false; referring to the basidiomes that are easily mistaken for those of *M. purpureostriatus* Hongo.

*Pileus* 14–38 mm latus, convexus usque depressus, glaber, plicatus, flavidus usque cinereo-flavus cum penitus lineis porphyreis. *Contextus* cinereo-flavus, tenuis. *Lamellae* adnexae, distantes (9–11) cum 0–1 serie lamellularum, angustae, cinereo-flavus, haud marginatae, haud intervenosae. *Stipes* 62–80 × 1.5–3 mm, centralis, cylindraceus usque sursum contractus, cavus, glaber, haud insititius, apice cinereo-magenteo, basi brunnea. *Odor saporque* non propria. *Basidiosporae* 20–25 × 5–6.2 µm, clavatae usque subfusoideae, saepe oblique curvae, hyalinae, inamyloideae, tenuitunicatae. *Basidiolae* cylindraceae usque clavatae. *Cheilocystidia* vulgaria, 12–25 × 6–12 µm, clavata usque late clavata, hyalina, inamyloidea, tenuitunicata. *Pleurocystidia* nulla. *Pileipellis* hymeniformis, cellulis typi *Globularis*, 14–23 × 10–11 µm, clavatis usque late clavatis, hyalinis, inamyloideis, tenuitunicatis usque crassetunicatis (usque ad 1 µm). *Trama pilei* intertexta, dextrinoidea. *Trama lamellarum* intertexta, hyphis 4–10 µm diam., cylindraceis usque inflatis, laevibus, hyalinis, dextrinoideis, tenuitunicatis, haud gelatinosis. *Stipitipellis* subparallelus, hyphis (3–) 5–10 µm diam., cylindraceis, brunneis usque pallide brunneis, laevibus, dextrinoideis, tenuitunicatis usque crassetunicatis (usque ad 1 µm), haud gelatinosis. *Trama stipitis* subparallela, hyphis 5–12 µm diam., cylindraceis, laevibus, hyalinis, dextrinoideis, tenuitunicatis. *Caulocystidia* nulla. *Fibulae* praesentes in omnibus texturis. Sparsus usque gregarius in folia plantarum dicotyledonearum.

***Holotypus***: Thailand, Chiang Rai Province, Weing Papoa District, Khun Chae National Park, N19° 4.405', E99°23.543', 963 m alt., 10 June 2005, N. Wannathes 286 (CMU).

*Pileus* 14–38 mm broad, convex to depressed, dull, glabrous, plicate, disc and plicae dark purple (14F5) to dark magenta (13F7), striped with pale yellow (3A3) to greyish yellow (4B4) ridges. *Context* greyish yellow (4B4), thin. *Lamellae* adnexed, distant (9–11) with 0–1 series of lamellulae, narrow, greyish yellow (4B4), non-marginate, non-intervenose. *Stipe* 62–80 × 1.5–3 mm, central, cylindrical to tapering upwards, hollow, glabrous, non-insititious, apex greyish magenta (14E5), base brown (7E7). *Odor* and *taste* not distinctive.




**Figs 20-24.** *Marasmius pseudopurpureostriatus* (N. Wannathes 286). **20** Basidiomes. **21** Basidioles. **22** Pileipellis. **23** Cheilocystidia. **24** Basidiospores. Scale bar: 20 = 10 mm, 21-24 = 10 µm.

*Basidiospores* 20–25 × 5-6.2 µm [$x_m$ = 22.8 ± 2.4 × 5.6 ± 0.6, Q = 3.9–4.4, $Q_m$ = 4.1, n = 4 spores, s = 1 specimen], clavate to subfusoid, often curved in profile, hyaline, inamyloid, thin-walled. *Basidia* not observed. *Basidioles* cylindrical to clavate. *Cheilocystidia* common, 12–25 × 6–12 µm, clavate to broadly clavate, hyaline, inamyloid, thin-walled. *Pleurocystidia* absent. *Pileipellis* a hymeniform layer of *Globulares*-type cells, 14–23 × 10–11 µm,

clavate to broadly clavate, hyaline, inamyloid, thin- to thick-walled (up to 1 µm). *Pileus trama* interwoven, dextrinoid. *Lamellae trama* interwoven, hyphae 4–10 µm diam., cylindrical to inflated, hyaline, smooth, dextrinoid, thin-walled, non-gelatinous. *Stipitipellis* subparallel, hyphae (3–) 5–10 µm diam., cylindrical, brown to light brown, smooth, dextrinoid, thin- to thick-walled (up to 1 µm), non-gelatinous. *Stipe trama* subparallel, hyphae 5–12 µm diam., cylindrical, hyaline, smooth, dextrinoid, thin-walled. *Caulocystidia* absent. *Clamp connections* present in all tissues.

*Habit*, *habitat and known distribution*. Scattered to gregarious on dicotyledonous leaves, Northern Thailand.

*Material examined*: THAILAND, Chiang Rai Province, Weing Papoa District, Khun Chae National Park, N19°4.405', E99°23.543', 963 m alt., 10 June 2005, N. Wannathes 286 (Holotype: CMU; Isotype: SFSU).

*Commentary*. Basidiomes of *Marasmius pseudopurpureostriatus* look like a robust form of *M. purpureostriatus* Hongo (1958), and the two species may be confused in the field. *Marasmius purpureostriatus* differs from the new species in forming smaller pilei (13–20 mm diam.) with darker violet disc and plicae and more whitish ridges, has a thinner stipe (< 1.5 mm), and slightly longer basidiospores (21–30 µm with mean length about 24 µm). ITS sequence data support the distinction of *M. pseudopurpureostriatus* from *M. purpureostriatus* (published elsewhere). *Marasmius pseudopurpureostriatus* is also similar to *M. bekolacongoli*, a species widespread in tropical Africa, but the latter differs in forming pilei that are violaceous brown to dull red or greyish red with lemon yellow stripes, and a much larger stipe (50–150 × 2.5–10 mm).

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