

A new species of a bluing *Psilocybe* from Asia (Basidiomycota, Agaricales, Strophariaceae)

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Psilocybe taiwanensis is described as a new species from a subtropical mountain rain forest in Taiwan, China with *Cryptomeria japonica* and *Taiwania cryptomerioides* (Cupressaceae). – The species belongs to section *Stuntzii*; all species of the section contain the psychoactive compound psilocybine.

Key words: Halucinogenic agaric, Taiwan, subtropical mountain forest.

An interesting bluing *Psilocybe* was found in the subtropical mountains of Taiwan, and is described here as a new species. As already discussed by Guzmán (1979, 2005, 2009), Guzmán *et al.* (2007a) and Horak *et al.* (2009) the diversity of bluing *Psilocybe* in the tropical mountain rain forests between 1000–3000 m altitude is high, so it is not unlikely to find new species in those regions.. The 21 known Asiatic species of bluing *Psilocybe* (Guzmán, 2005, 2009; Guzmán *et al.*, 1998) are recorded from tropical or subtropical forests in the South and Southern of Asia.

Materials and Methods

For light microscopy, sections were mounted in 5 % KOH or 1 % Congo Red, after a previously re-hydrating in 96 % alcohol. – Basidiospore measurements include length in face-view and width in face-view and side-view. – At least 25 measurements were taken.

Taxonomy

Psilocybe taiwanensis Zhu L. Yang & Guzmán, **sp. nov.** Figs. 1–6
MycoBank no.: MB 516554

Pileus 10– 20–30 mm diam., convexus vel subumbonatus, subconicus vel umbonatus, subpapillaris, brunneus vel fulvus vel fuscus, hygrophaneus, marginis cum

flocculosa leuco squamae. Lamellae subadnexed, griseolus brunneus vel fuscus rufobrunneus. Stipe 50–80 × 2–5 mm, albus vel fulvus, subtunicatus cum flocculosa leucosquamae, caeruleus. Cortina albus, arachnoideus submembranaceus. Annulus submembranaceus, vel flocculosus, caeruleus. Sporae (5.5–) 6–7 × (3.5–) 4–4.5 × 3.5–4 µm, subrhomboideae frontaliter, crassitunicate, brunneus. Pleurocystidia 15–20 × (4.5–) 5.5–6.5 (–7) µm, common, hyaline, oblongus vel subclavatus, rostratus. Cheilocystidia (13.5–) 15–20 (–25) × 4–5.5 (–6.5) µm, hyaline, idem pleurocystidia. Pileipellis expers gelatina, cum subcystidia. Hyphae fibulate. Ad humus, sylvis mountains subtropicalibus.

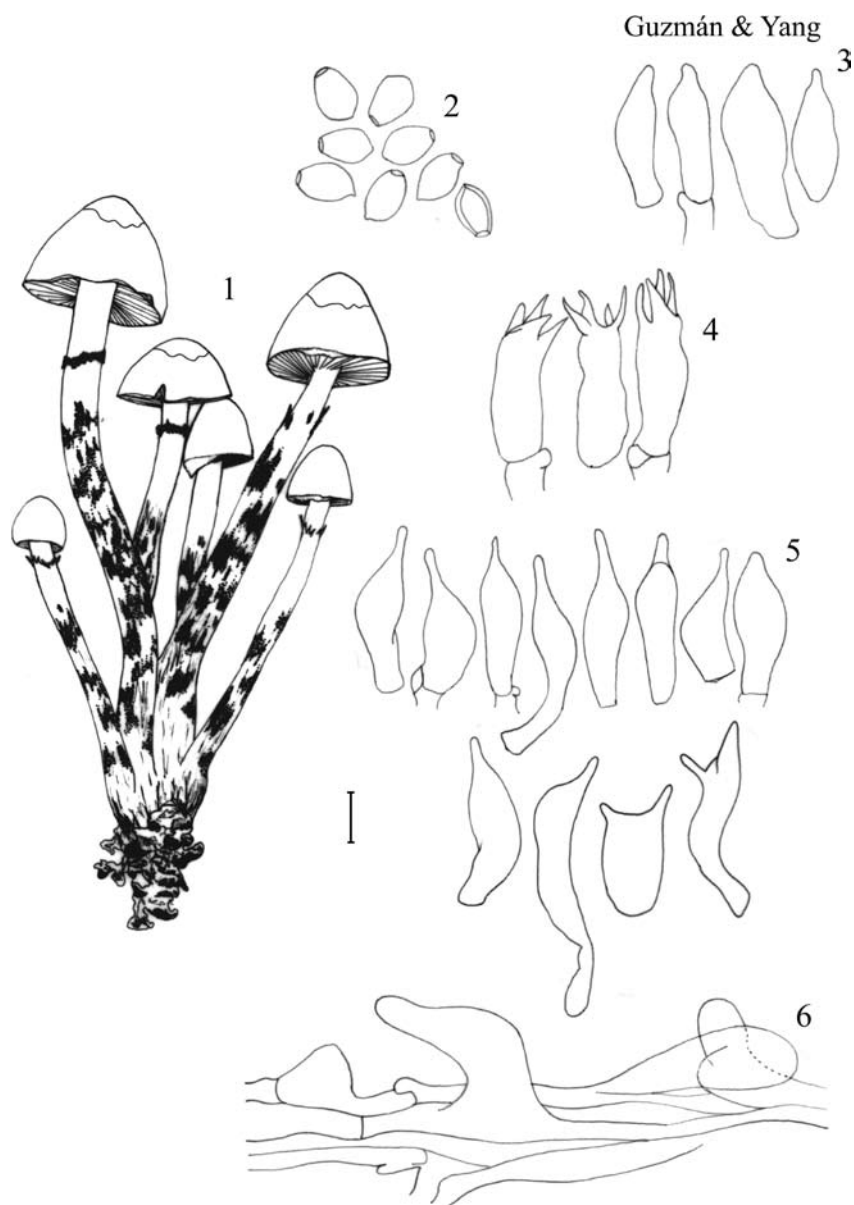
Holotypus. – China, Taiwan, Yang 4637 (HKAS 49976; isotype XAL).

Pileus (10–) 20–30 mm diam., smooth, convex to subumbonate or subconical-umbonate, shortly papillate, brown to tea brown, hygrophane, becoming paler to cream or yellowish; in dry specimens dark cinnamon-brown, reddish-brown or blackish red-lead; margin with white floccose remnants from the veil. – Lamellae subadnexed, grey-brown to dark reddish-brown or dark violet, edges whitish. – Stipe 50–80 × 2–5 mm, uniform, whitish to pale brownish, covered with white fibrillose to patch-like squamules toward the base, bluing, in dry specimens is dark reddish-brown to blackish or red-lead. – Veil white, submembranous to arachnoid. – Annulus fragile, submembranous to floccose, ephemorous, bluing. – Mycelium white at the base of the stipe. – Context whitish, bluing.

Basidiospores (5.5–) 6–7 × (3.5–) 4–4.5 × 3.5–4 µm, subrhomboid in face-view, subellipsoid in side-view, thick-walled, wall up to 0.8 µm thick, brownish-yellow with wide germ pore. – Basidia 19–20 × 5–6.5 µm, 4-spored, clavate-ventricose, sometimes with a median constriction, hyaline. – Pleurocystidia 15–20 × (4.5–) 5.5–6.5 (–7) µm, hyaline, common, oblong-subclavate rostrate, sometimes with a median constriction. – Cheilocystidia (13.5–) 15–20 (–25) × 4–5.5 (–6.5) µm, hyaline, form as the pleurocystidia, but with the rostrum more long, sometimes irregularly divided. – Subhymenium subcellular, hyaline to yellowish. – Hymenophoral trama regular, hyaline. – Pileipellis a subcutis no or poor subgelatinized, 14–24 µm thick, with postrated, hyaline, 3–5 µm wide hyphae, bluing, with cystidioid elements in the surface, subcylindric-ventricose, 8–10 × 4–5.5 µm or as globose irregular prolongations of the postrated hyphae. – Subpellis with hyaline to yellowish globose elements, 2–4 µm diam., bluing. – Clamp connections present.

Habitat and distribution. – Gregarious or caespitose, on litter in a subtropical raining mountainous forest, dominated by trees of *Cryptomeria japonica* (L.f.) D. Don and *Taiwania cryptomeroides* Hayata. – Known only from the type locality.

Material examined: Holotype. – *Psilocybe taiwanensis* Yang & Guzmán: CHINA, Taiwan Province, Nantou Country, Shitou, 12 April 2006, Z.L. Yang 4637 (holotype HKAS 49976; isotype XAL).



Figs. 1–6. *Psilocybe taiwanensis*. 1: basidiomata. 2: spores, 3: pleurocystidia, 4: basidia, 5: cheilocystidia, 6: pileipellis with cystidioid elements. Bar = 10 mm (Fig. 1); bar = 6 μ m (Figs 2–6); all figures from the holotype.

Discussion

Following the taxonomical concept proposed by Guzmán (1983, 1995) *Psilocybe taiwanensis* belongs to section *Stuntzii* Guzmán because of its subrhomboid thick-walled spores, an distinct annulus and the bluing feature, According to Guzmán (1995) a species with similar small spores as *P. taiwanensis* is *P. jacobsii* Guzmán. The latter is only known from Mexico and has rhomboid spores. *Psilocybe jacobsii* belongs to section *Cordisporae* Guzmán. The basidioma of *P. taiwanensis* is similar to that of *P. venenata* (Imai) Imaz. & Hongo, but it has subellipsoid spores in both side- and face-view, $(8-10-12 (-14) \times 6-7 (-9) \times 5.5-6 \mu\text{m})$, and no pleurocystidia. *Psilocybe venenata* to section *Semilanceatae* and it is known from Japan (Guzmán, 1983) and probably from China. *Psilocybe mescaleroensis* Guzmán, Walstad, E. Gándara & Ram.-Guill (section *Stuntzii*). recently described from a *Pinus* forest in New Mexico, U.S.A. (Guzmán *et al.* 2007b) has no pleurocystidia and larger sub-rhomboid spores measuring, $(9-10-11 (-13) \times 6-7 (-8) \times 6-7 \mu\text{m})$. *Psilocybe meridionalis* Guzmán, Ram.-Guill. & Guzm.-Dáv., another member of section *Stuntzii*, was recently described from a subtropical forest with *Quercus* in Mexico (Guzmán *et al.*, 2008). It has spores similar to those of *P. taiwanensis* but its pleurocystidia are $11-14 \times 4-6 \mu\text{m}$, its cheilocystidia are $13-26 \times 4-5.5 \mu\text{m}$ and more polymorph, and the pileipellis has not the cystidioid elements as observable in *P. taiwanensis*. Moreover, the bluing feature is not as conspicuous as in *P. taiwanensis*..

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