

## Two new species and one new variety of Agaricales from central Honshu, Japan

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Two new species and one new variety of Agaricales are described and illustrated from central Honshu, Japan: *Clitocybe trogioides* var. *odorifera* var. nov. (subgenus *Cystoclitus* section *Cystoclitus*), forming white, infundibuliform basidiomata, was collected from leaf litter in the *Quercus-Pasania* forests; *Gerronema nemorale* sp. nov. (section *Xanthophylla*), forming small, olivaceous, omphalinoid basidiomata, was found on dead fallen twigs in the *Quercus-Pasania* forests; *Psathyrella cineraria* sp. nov. (subgenus *Mycophylla* section *Argillosporae*), forming basidiomata covered by detersile, dark grey, fibrillose-squamulose veil, was found on decayed wood of *Quercus myrsinaefolia*.

Key Words—Agaricales; *Clitocybe trogioides* var. *odorifera*; *Gerronema nemorale*; *Psathyrella cineraria*; taxonomy.

During recent surveys of agaric flora in the lowland forest of central Honshu, Japan, several noteworthy collections have been made. Studies of these collections revealed two new species and one new variety, viz. *Clitocybe trogioides* var. *odorifera*, *Gerronema nemorale*, and *Psathyrella cineraria*. These species are described and illustrated with photographs showing macromorphological features. Color notations in parentheses are taken from Kornerup and Wanscher (1978). Specimens cited are preserved in the Natural History Museum and Institute, Chiba, Japan (CBM) and Kanagawa Prefectural Museum of Natural History, Japan (KPM).

### Species descriptions

*Clitocybe trogioides* Corner, Beihefte Nova Hedwigia 109: 126. 1994. var. *odorifera* Har. Takahashi, var. nov. Figs. 1–3

A typo differt cellulis pileipellis sphaerocystis terminalibus intus granulis coagulatis praeditis.

Holotypus: In folia dejecta in silva, Yamato-shi, Kanagawa-ken, Japonia, 15 Jul. 1998, H. Takahashi (CBM-FB-24119).

Etymology: from Latin, *odorifera* = emitting a smell.

Pileus 20–50 mm in diam, infundibuliform from the first, margin incurved at first, smooth, hygrophanous, translucent-striate when wet, glabrous, white, pale yellowish in age. Flesh thin (up to 1.8 mm thick), white; odor strongly farinaceous, taste not distinctive. Stipe 20–30 × 2–15 mm, subequal or tapering toward the base, central, terete, brittle, hollow, white, smooth, glabrous, with white basal tomentum. Lamellae arcuate-decurrent, subdistant (18–25 reach the stipe), very narrow (1–1.5 mm broad) and thin, occasionally branching dichotomously with lamellulae, shallowly intervenose, white; edges even, concolorous.

Basidiospores 5–6.5 × 3–4 μm, ovoid-ellipsoid, smooth, colorless, inamyloid, thin-walled. Basidia 21–29 × 5–6.5 μm, clavate, four-spored. Lamella-edge fertile. Pleurocystidia and cheilocystidia absent. Elements of hymenophoral trama 30–70 × 4–9.5 μm, cylindrical, subparallel, smooth, colorless, walls up to 1 μm thick. Pileipellis a cutis of subparallel or irregularly interwoven, repent hyphae with tubular element cells 15–60 × 2–6 μm, terminal cells 17–60 × 10–17 μm, vesiculose or broadly clavate, with remarkable hyaline tubercular-coagulate contents, walls up to 1 μm thick, hyaline, smooth. Pileitrama of cylindrical, subparallel or loosely interwoven hyphae, with smooth, hyaline walls up to 1 μm thick; element cells 20–70 × 2.5–6 μm. Stipitipellis composed of interwoven, repent hyphae with element cells 30–110 × 4–8 μm, cylindrical, occasionally intermixed with vesiculose terminal elements as in the pileipellis, smooth, colorless, walls up to 1 μm thick. Elements of stipe trama 50–120 × 4–10 μm, cylindrical, more or less longitudinally oriented, smooth, colorless, walls up to 1 μm thick. Hyphae with clamps.

Known distribution: Japan (Chiba, Kanagawa, Tokyo).

Habitat: Solitary to caespitose, on leaf litter in lowland forests dominated by *Quercus serrata* Thunb., *Pasania edulis* Makino and *Ligustrum japonicum* Thunb., from July to October, common.

Holotype: CBM-FB-24119, on leaf litter in *Quercus-Pasania* forests, Yamato-shi, Kanagawa-ken, 15 Jul. 1998.

Other specimens examined: KPM-NC-0005003, on leaf litter in deciduous oak forest, Machida-shi, Tokyo, 19 Jul. 1992; KPM-NC-0005004, on leaf litter in deciduous oak forest, Machida-shi, Tokyo, 23 Sept. 1993; CBM-FB-24118, on leaf litter in *Quercus-Pasania* forests, Yamato-shi, Kanagawa-ken, 22 Sept. 1997; CBM-FB-

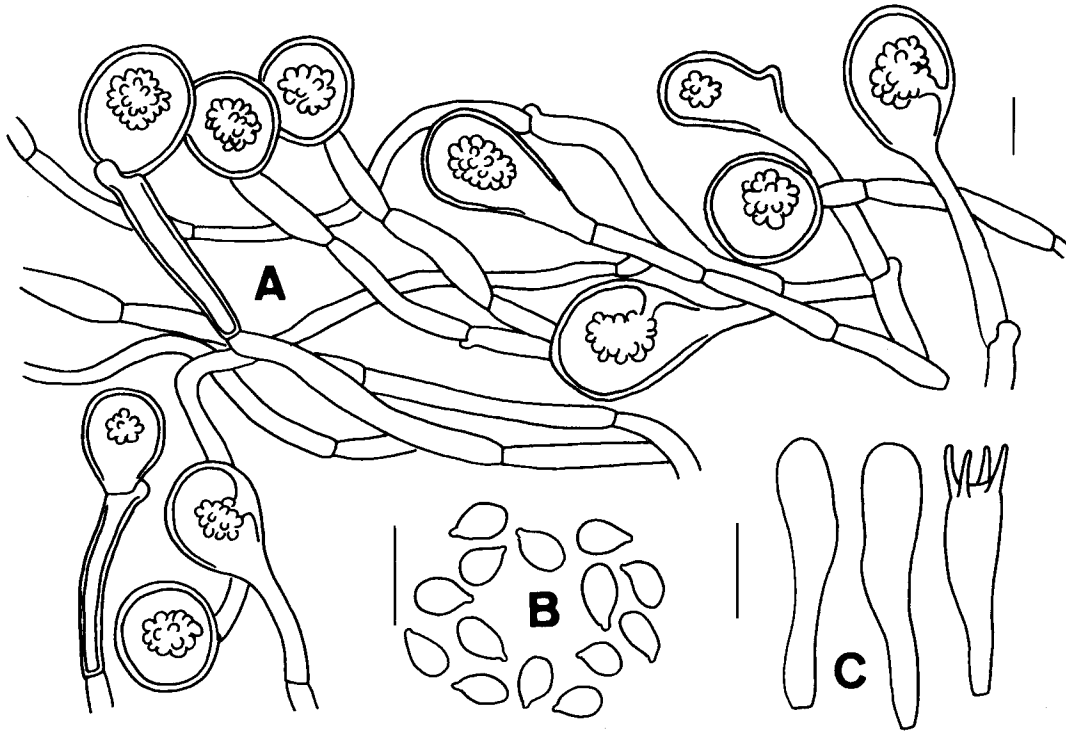


Fig. 1. *Clitocybe trogioides* var. *odorifera*.

A. Elements of pileipellis. B. Basidiospores. C. Basidium and basidioles. Scales: 10  $\mu$ m. All figures from the holotype.

16056, on leaf litter in deciduous oak forest, Sakura-shi, Chiba-ken, 4 Oct. 1997.

Japanese name: Yuki-rappatake.

**Notes:** The type variety of *Clitocybe trogioides*, recently described from Sri Lanka by Corner (1994), is easily recognized by the white, infundibuliform basidiomata, the veined lamellae, and the vesiculose terminal elements of the pileipellis. The Japanese variety *odorifera*, described herein, differs from it in having a strongly farinaceous smell, moderately larger basidiospores (4–4.3  $\times$  2.8–3  $\mu$ m in var. *trogioides*; Corner, 1994), and remarkable hyaline tubercular-coagulate contents in the vesiculose terminal cells of the pileipellis hyphae.

The irregularly arranged pileipellis hyphae in the expanded pilei of *C. trogioides* (including var. *odorifera*) form a cutis-like structure. This structure suggests that *C. trogioides* belongs to section *Bulluliferae* in the subgenus *Cystoclitus*. However, if greater taxonomic emphasis is placed on the presence of vesiculose cells that are terminally disposed in the pileipellis hyphae, it would be better placed in section *Cystoclitus* of the same subgenus than in section *Bulluliferae*; members of the latter section also have vesiculose cells in the pileipellis hyphae, but the cells are disposed not terminally but interposally.

***Gerronema nemorale*** Har. Takahashi, sp. nov. Figs. 4–9

Pileus 6–15 mm lato, primo hemisphaerico, dein convexo et centro depresso, mox concavo vel umbilicato, striato-sulcato, fibrilloso, primo olivaceo-brunneo, mox obscuro-flavido vel griseo-viridi; odore saporeque nullo;

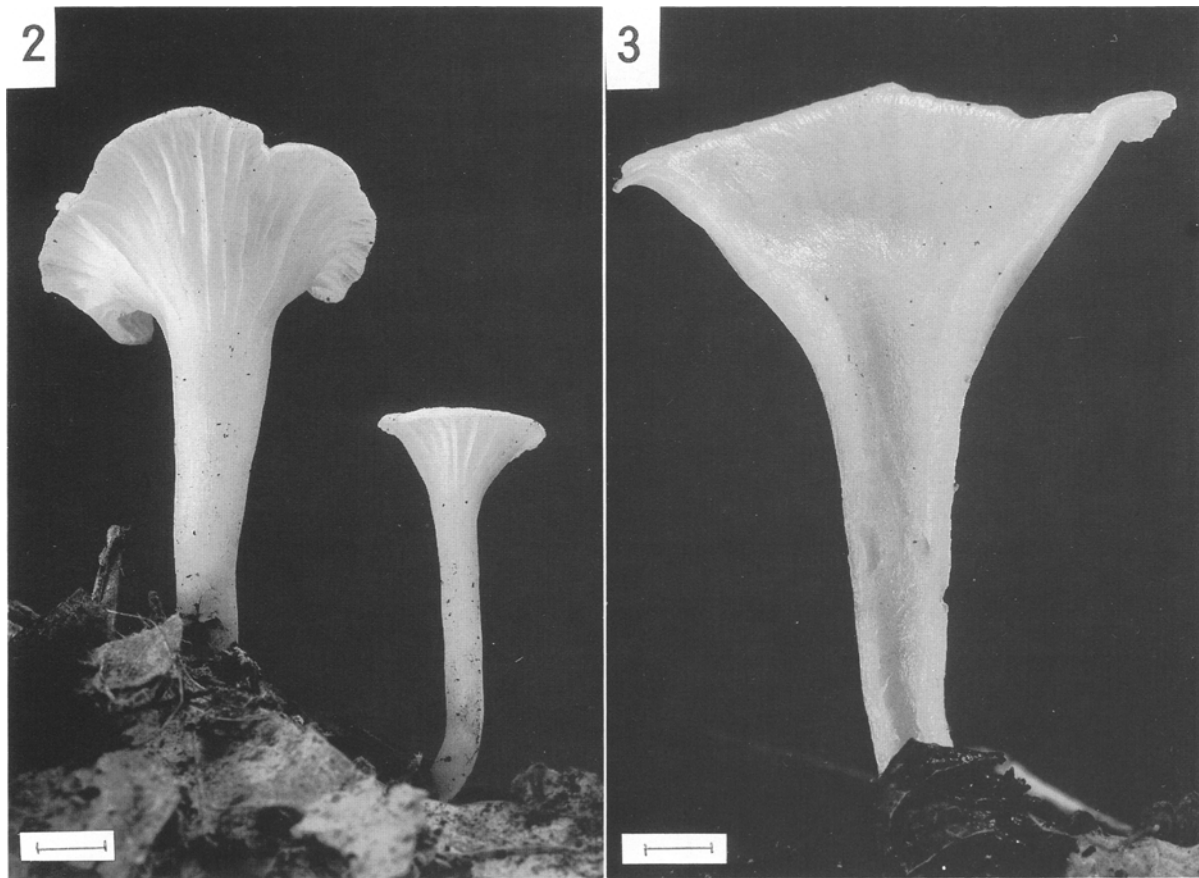
stipite 20–40  $\times$  1–2.5 mm, subaequali vel ad basim leniter incrassato, cavo, flavido, furfuraceo, mycelio basali albo-strigoso; lamellis arcuatis, decurrentibus, mediocriter subdistantibus, angustis, flavido; basidiosporis 8.5–10  $\times$  5–6  $\mu$ m, late ellipsoideis, levibus, hyalinis, inamyloideis; basidiis tetrasporis; cheilocystidiis irregulariter cylindraceutis vel strangulatis; pleurocystidiis nullis; pileocystidiis late claviformibus vel capituliformibus; caulocystidiis irregulariter cylindraceutis vel late claviformibus; hyphis fibulatis.

**Holotypus:** In ramulis arboris delapsis in silva, Yamato-shi, Kanagawa-ken, Japonia, 27 Jun. 1996, H. Takahashi (CBM-FB-24129).

**Etymology:** from Latin, *nemorale* = pertaining to woods; referring to the habitat growing in woodlands.

Pileus 6–15 mm in diam, at first hemispherical, then convex with depressed center, eventually concave or umbilicate, at first smooth but soon radially striate to sulcate, pruinose when young, innately fibrillose-striate, olive brown (4F4–4F6, 4E5–4E7) when young, then greyish green (29E5, 30E5), finally dull yellow (3B4), margin sometimes undulate. Flesh very thin (up to 0.5 mm), pale yellow; odor and taste not distinctive. Stipe 20–40  $\times$  1–2.5 mm, almost equal but swollen at the base, central or somewhat eccentric, slender, terete, tough, hollow, pale yellow (3A3), furfuraceous overall; base covered with conspicuous white mycelioid bristles. Lamellae arcuate-decurrent, subdistant (25–35 reach the stipe), narrow (0.8–1.2 mm broad), thin, pale yellow; edges fimbriate, concolorous.

Spore print pure white. Basidiospores 8.5–10  $\times$  5–



Figs. 2, 3. *Clitocybe trogioides* var. *odorifera*.

2. Mature basidiomata. 3. Section of mature basidiomata.

Scales: 2 = 10 mm; 3 = 5 mm. All figures from CBM-FB-24118.

6  $\mu\text{m}$ , ellipsoid to broadly ellipsoid, smooth, colorless, inamyloid, thin-walled. Basidia 26–35  $\times$  5–7  $\mu\text{m}$ , clavate, four-spored. Cheilocystidia 30–50  $\times$  4–7  $\mu\text{m}$ , abundant, irregularly cylindrical to strangulated, smooth, colorless or with pale yellow contents, thin-walled. Pleurocystidia absent. Hymenophoral trama subregular; element cells 30–150  $\times$  3–8  $\mu\text{m}$ , cylindrical, occasionally branching, with a few knob-like processes, walls thin, smooth, colorless, inamyloid, sometimes intermixed with elongate, cylindrical, thick-walled (up to 1.5  $\mu\text{m}$  thick) cells 7–11  $\mu\text{m}$  diam. Pileipellis a cutis of interwoven, repent hyphae with element cells 35–90  $\times$  2–4.5  $\mu\text{m}$ , cylindrical, smooth, colorless or with pale olive-brown to pale yellow contents, thin-walled; terminal cells (pileocystidia) 15–37  $\times$  2–8  $\mu\text{m}$ , broadly clavate to capitulate, decumbent. Elements of pileitrampa 70–150  $\times$  5–10  $\mu\text{m}$ , subparallel, cylindrical, occasionally branching, with a few knob-like processes, walls thin, smooth, colorless, inamyloid, sometimes intermixed with elongate, cylindrical, thick-walled (up to 1.5  $\mu\text{m}$  thick) cells 7–11  $\mu\text{m}$  diam. Stipitipellis a cutis of parallel, repent hyphae 3–5  $\mu\text{m}$  wide, cylindrical, smooth, colorless or with pale yellow contents, thin-walled; terminal cells (caulocystidia) 25–60  $\times$  3.5–8  $\mu\text{m}$ , irregularly cylindrical to broadly clavate, often with capitate apex, ascendant. Stipe trama com-

posed of longitudinally running, thick-walled (up to 1.5  $\mu\text{m}$  thick) cells 5–13  $\mu\text{m}$  wide, cylindrical, unbranched, smooth, colorless, inamyloid. Pigment incrustations absent. Clamps present in all tissues.

Known distribution: Japan (Kanagawa, Tokyo).

Habitat: Solitary to caespitose, on dead fallen twigs in lowland forests dominated by *Pasania edulis* Makino, *Quercus myrsinaefolia* Blume and *Ligustrum japonicum* Thunb., from May to October, common.

Holotype: CBM-FB-24129, on dead fallen twig in *Quercus-Pasania* forests, Yamato-shi, Kanagawa-ken, 27 Jun. 1996.

Other specimens examined: CBM-FB-24128, on dead fallen twig in *Quercus-Pasania* forests, Yamato-shi, Kanagawa-ken, 12 May 1994; CBM-FB-24130, on dead fallen twig in deciduous oak forest, Mt. Takao, Hachiojishi, Tokyo, 10 Aug. 1998.

Japanese name: Oriibu-sakazukitake.

**Notes:** The important combination of features delimiting this species is the relatively small, olivaceous, omphalinoid basidiomata with an innately fibrillose pileus, the irregularly cylindrical cheilocystidia, the broadly clavate pileocystidia and caulocystidia with yellow intracellular pigments, and the lignicolous habitat. These characteristics place this species in the genus *Gerronema* sec-

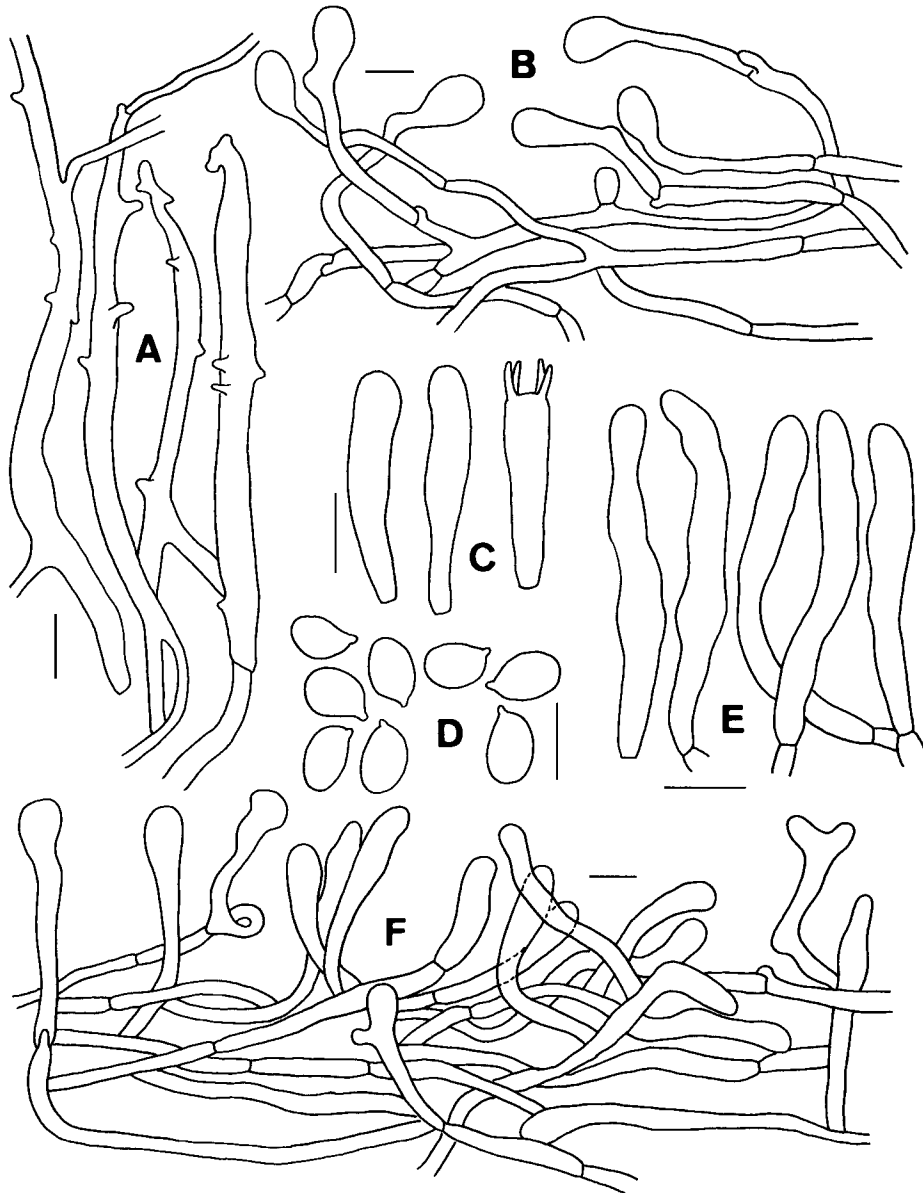


Fig. 4. *Gerronema nemorale*.

A. Tramal hyphae of pileus. B. Elements of pileipellis. C. Basidium and basidioles. D. Basidiospores. E. Cheilocystidia. F. Elements of stipitepellis. Scales: A=20  $\mu$ m; B-F=10  $\mu$ m. All figures from the holotype.

tion *Xanthophylla* Singer (Singer, 1986), where it seems to be allied with several neotropical taxa, viz. *Gerronema icterinum* (Singer) Singer (Singer, 1948; Pegler, 1983), *G. tenue* Dennis (Dennis, 1961; Pegler, 1983), and *G. citrinum* (Corner) Pegler (Corner, 1966; Pegler, 1983). The latter three taxa differ primarily in forming fertile lamella edges without cheilocystidia. Moreover, *G. icterinum* has veined and forked lamellae, while *G. tenue* has a citrine yellow pileus and an insititious stipe. *Gerronema citrinum* also differs in having a relatively larger pileus (20–30 mm in diam: Corner, 1966) colored greyish brown toward the center and in having much smaller basidiospores (6–7.5  $\times$  3.5–4  $\mu$ m: Corner, 1966) associated with two-spored basidia. *Gerronema*

*nemorale* is also comparable with two Malaysian taxa in having cheilocystidia, viz. "*Trogia*" *anthidepas* (Berk. et Broome) Corner (Corner, 1966) and "*Trogia*" *mellea* Corner (Corner, 1966). The latter two taxa are distinct in having no olivaceous tones in the pileus surface, fuscous pruinose pileus center and stipe, subclavate or subventricose cheilocystidia, and in lacking mycelial bristles at the base of stipe. Furthermore, *T. anthidepas* has much larger pileus (10–60 mm in diam: Corner, 1966), and *T. mellea* forms conspicuous mycelial strands on the substratum.

*Psathyrella cineraria* Har. Takahashi, sp. nov.

Figs. 10–14



Fig. 5. Immature basidiomata of *Gerronema nemorale*.  
Scale: 2 mm. CBM-FB-24128.

Pileo 30–60 mm lato, primo campanulato-semigloboso, dein convexo vel applanato, e medio versus marginem radiatim striato, hygrophano, in statu humectato obscure cineraceo, cum squamulis fibrillosis obscure cineraceis oblecto, mox glabro, ad marginem appendiculato; odore saporeque nullo; stipite 40–70 × 5–10 mm, aequali, cavo, pallide cineraceo, superne pruinoso, inferne squamulis fibrillosis-recurvatis obscure cineraceis detersibilibus oblecto, mycelio basali albo, villosa; lamellis adnexis, confertis, brunneis; basidiosporis 6.5–8.5 × 4–5 μm, melleis, levibus, ovoideis vel ellipsoideis, poro germinationis omnino destitutis; basidiis tetrasporis; cheilocystidiis utriformibus vel lageniformibus; pleurocystidiis nullis; hyphis fibulatis.

Holotypus: In ramulis delapsis *Quercus myrsinaefoliae* Blume, Yamato-shi, Kanagawa-ken, Japonia, 11 May 1998, H. Takahashi (CBM-FB-24144).

Etymology: from Latin, *cineraria* = ash-grey referring the color of pileus.

Pileus 30–60 mm in diam, at first campanulate-hemispherical, convex to applanate at maturity, sometimes obtusely umbonate, radially striate toward the margin, hygrophanous, dark grey when moist, drying to paler from the margin, center covered by a detersile dense coating of fibrillose, dark grey squamules of the veil, downy-fibrillose toward the slightly appendiculate margin, soon glabrescent. Flesh thin (up to 3 mm), dark grey in the center of the pileus, white elsewhere, odor and taste not distinctive. Stipe 40–70 × 5–10 mm, almost equal, central, terete, slender, brittle, hollow, pale grey, pruinose above, lower portion covered with detersile, dark grey, recurved fibrillose-squamules of the veil remnants, soon glabrescent; annulus absent; base covered with white, villose mycelium. Lamellae adnexed, crowded (44–50 reach the stipe), 4–7 mm broad, thin, at

first white then brown; edges fimbriate, concolorous.

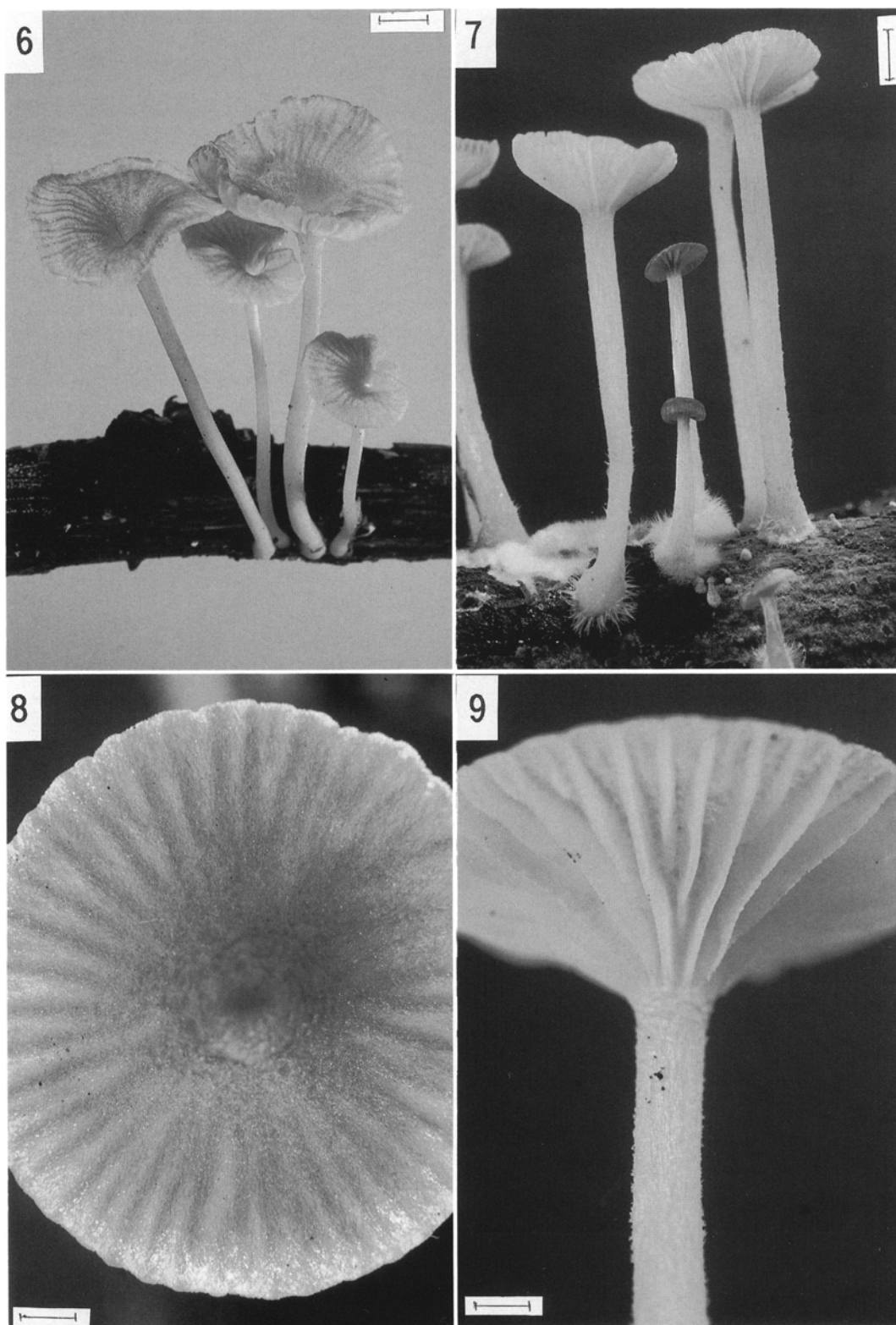
Spore print brown (6E6–6E7). Basidiospores 6.5–8.5 × 4–5 μm, ovoid to ellipsoid, smooth, melleous, thin-walled, without germ-pore. Basidia 24–30 × 4–10 μm, clavate, four-spored. Pleurocystidia absent. Cheilocystidia 25–50 × 5–18 μm, abundant, utriform to lageniform with an obtusely rounded apex, smooth, colorless, thin-walled. Hymenophoral trama regular; element cells 30–150 × 8–20 μm, ellipsoid to cylindric, smooth, colorless, thin-walled. Pileipellis an epithelium of subglobose to ellipsoid elements 25–95 × 20–40 μm, somewhat incrustrated with granules of dark grey pigment, thin-walled. Veil structure of pileus composed of cylindric elements 20–60 × 5–13 μm, walls thin, incrustrated with dark grey pigment granules. Pileitrama of subparallel, inflated hyphae; elements ellipsoid to cylindric, 50–160 × 16–22 μm, smooth, colorless, thin-walled. Stipitipellis a cutis of parallel, repent hyphae 4–6.5 μm wide, somewhat incrustrated with granules of dark grey pigment, thin-walled. Veil structure of stipe composed of branched, cylindric hyphae 2.5–8 μm wide, with ventricose to clavate, cystidioid terminal cells, 20–85 × 3.5–14 μm, walls thin, somewhat incrustrated with dark grey pigment granules. Hyphae of stipe trama 8–16 μm wide, cylindric, longitudinally running, smooth, colorless, thin-walled. Clamps present in all tissues.

Known distribution: Japan (Chiba, Kanagawa, Tokyo).

Habitat: Solitary to caespitose, on decayed wood of *Quercus myrsinaefolia* Blume, from April to October, not common.

Holotype: CBM-FB-24144, on decayed wood of *Q. myrsinaefolia*, Yamato-shi, Kanagawa-ken, 11 May 1998.

Other specimens examined: CBM-FB-24142, on



Figs. 6-9. *Gerronema nemorale*.

6, 7. Mature basidiomata. 8. Surface view. 9. Close up of underside of the pileus and stipe apex. Scales: 6=4 mm; 7=2 mm; 8, 9=1 mm. 6, from CBM-FB-24128; 7 from CBM-FB-24130; 8, 9 from the holotype.

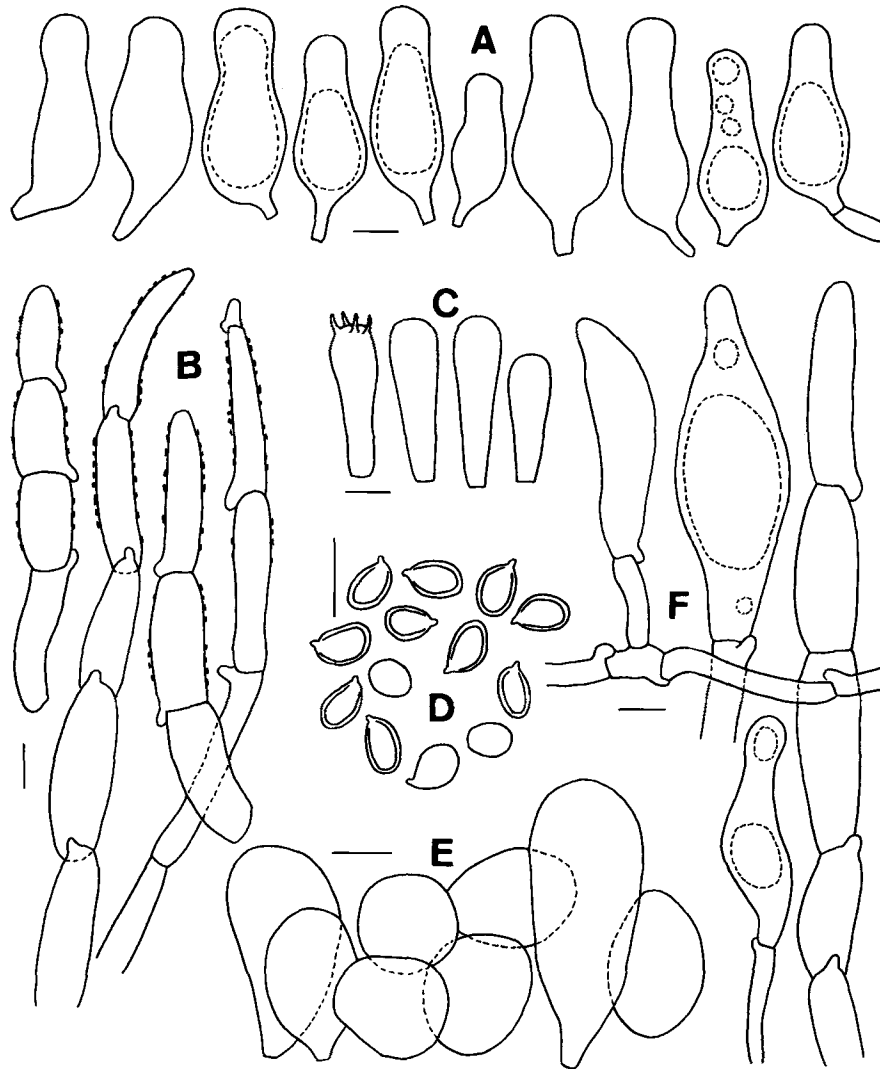


Fig. 10. *Psathyrella cineraria*.

A. Cheilocystidia. B. Veil elements on pileus surface. C. Basidium and basidioles. D. Basidiospores. E. Epithelium of pileipellis. F. Veil elements on stipe surface. Scales: A–D, F = 10  $\mu\text{m}$ ; E = 20  $\mu\text{m}$ . All figures from the holotype.

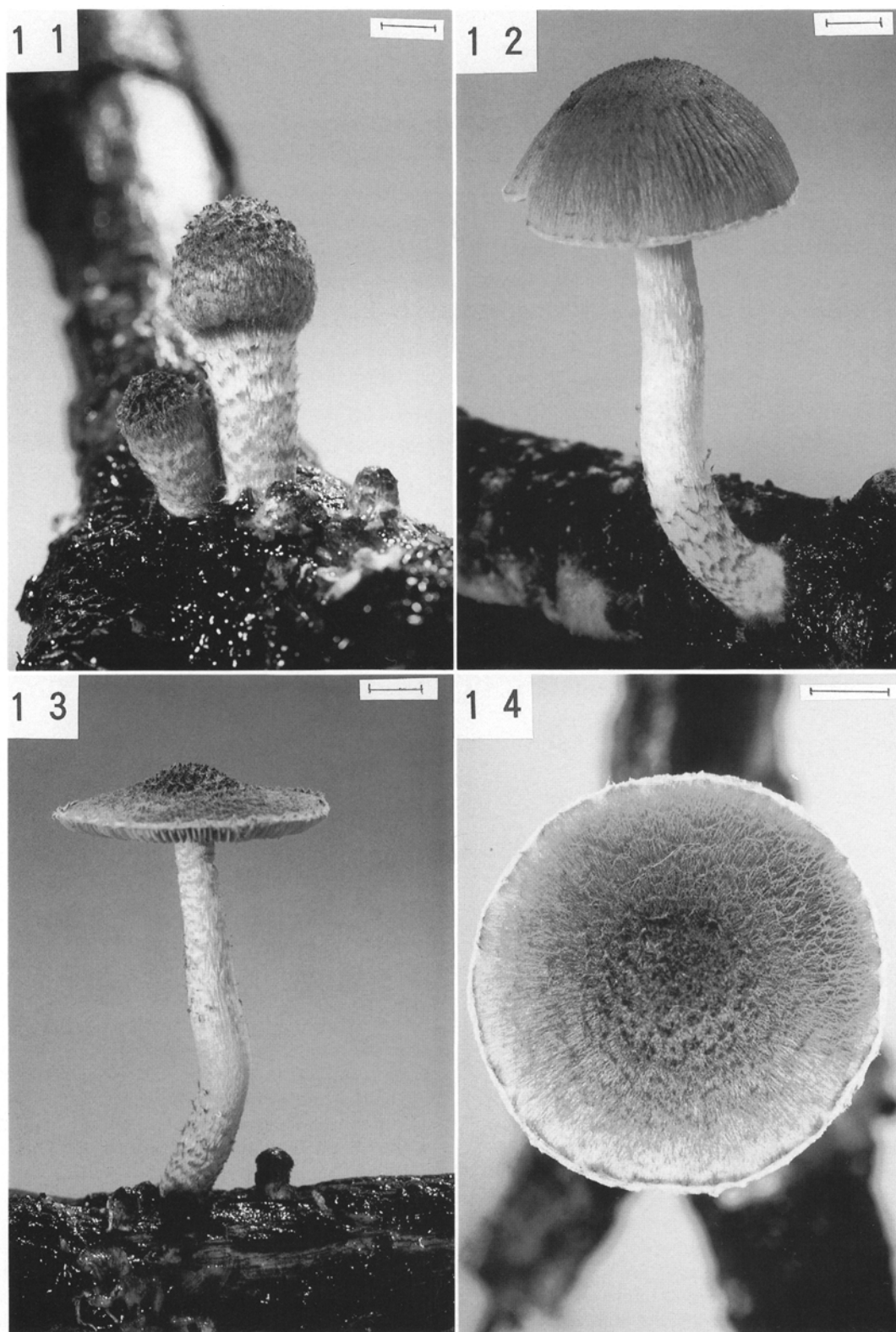
decayed wood of *Q. myrsinaefolia*, Yamato-shi, Kanagawa-ken, 5 May 1994; KPM-NC-0005005, on decayed wood of *Q. myrsinaefolia*, Setagaya-ku, Tokyo, 3 Jul. 1995; CBM-FB-24143, on decayed wood of *Q. myrsinaefolia*, Yamato-shi, Kanagawa-ken, 24 Apr. 1996; KPM-NC-0005006, on decayed wood of *Q. myrsinaefolia*, Sakura-shi, Chiba-ken, 4 Oct. 1997.

Japanese name: Haiiro-itachitake.

**Notes:** *Psathyrella cineraria* is not common in the lowland forest of eastern Japan, where it appears to be restricted in its growth on the decayed wood of *Quercus myrsinaefolia*, but further field work is necessary to clarify this point. The brown spore print, the relatively shorter basidiospores (less than 10  $\mu\text{m}$  long) without a germ pore, the utriform to lageniform cheilocystidia, the absence of pleurocystidia, and the colorless trama of the lamellae suggest that *P. cineraria* belongs to the section *Argillosporae* Singer in the subgenus *Mycophylla* A. H.

Smith in Singer's (1986) classification. *Psathyrella cineraria* differs from all previously described taxa of the section *Argillosporae* in the following combination of features: the dark grey incrusting pigment, the dark grey, detersile, fibrillose-squamulose outer veil that forms slightly appendiculate marginal veils in the pileus, and the absence of distinct annulus. Within the subgenus *Mycophylla*, *P. candolleana* (Fr.) Maire, the type species of the section *Candolleanae* (Romagn.) Singer, and *P. pseudogordonii* Kits van Wav. (Kits van Waveren, 1985) from England seem to be similar to *P. cineraria*. The former two taxa, however, differ in forming a white or ochreous veil, lacking pigment incrustation, and having basidiospores with a distinct germ pore. *Psathyrella uliginicola* McKnight & A. H. Smith (Smith, 1972) from North America also has a greyish pileus at the young stages, but it differs in having a white or whitish stipe, no pigment incrustation, significantly longer basidiospores





Figs. 11–14. *Psathyrella cineraria*.

11, 12. Immature basidiomata. 13. Mature basidioma. 14. Surface view. Scales: 11=2 mm; 12=5 mm; 13, 14=10 mm. All figures from the holotype.



(10–12  $\mu\text{m}$  long) with a distinct germ pore, and a habit under aspen.

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