

Takahito Kobayashi

Notes on the genus *Inocybe* of Japan: III

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Abstract Six *Inocybe* species are described and illustrated as new taxa or new records from Japan. A new species, *Inocybe magnicarpa*, is a member of section *Marginatae*. Two new varieties, *I. malenconii* var. *cylindrata*, a member of section *Dulcamarae*, and *I. brunneorufa* var. *angusta*, a representative of section *Marginatae*. *Inocybe reisneri* (section *Rimosae*) and *I. fuscidula* (section *Tardae*), are recorded as new to Japan. *Inocybe pseudodestructa* (section *Tardae*) is redescribed from a new locality (Chiba Prefecture). They are compared with similar taxa.

Key words Agaricales · Cortinariaceae · *Inocybe* · Japan · Systematics

Introduction

Six *Inocybe* species collected from Japan have been reported in this series (Kobayashi 2002a, 2003). The author recently obtained from central and eastern Honshu several collections of *Inocybe* that represent new taxa, new records in Japan, or a rediscovering in Chiba. In this article, they are described with illustrations.

Materials and methods

The specimens cited in this article are deposited in the herbaria of the Hokkaido University Museum (SAPA), the

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Natural History Museum and Institute, Chiba (CBM), the National Museum, Prague, Czech Republic (PRM), and the author's private herbarium (TAKK) in Sapporo, Japan. For color notations and microscopic observations, see Kobayashi (2002b). Two indices of slenderness, IS and ISB, were defined by Kobayashi and Courtecuisse (1993) and Kobayashi (2002a), respectively. Reagents used include FeCl₃ (FeCl₃·6H₂O (20%)), NH₄OH (NH₄OH, 10%), aniline (pure aniline), phenol (phenol, 2%), and KOH (KOH 5%), unless otherwise noted.

Taxonomy

Subgenus *Inosperma* Kühner

Section *Dulcamarae* R. Heim

Inocybe malenconii R. Heim (Le genre *Inocybe*: 163. fig. 120, pl. 5/1. 1931) var. *cylindrata* Takah. Kobay., var. nov.

Figs. 1, 7A

A typo differt cheilocystidiis cylindratis, angustis.

Holotypus: TAKK 99.6.27.106-1 (SAPA).

Pileus 18.5–30 mm broad, hemispherical when young, then convex, subumbonate, scaly on umbo, brownish-yellow to yellowish-brown (10YR 5-6/6), scales on half the radius deep brown (7.5YR 5/6–8). Lamellae adnexed, close, pale yellow (2.5Y 7/4) when young, then olive-yellow to light olive-brown (2.5Y 5–6/6), edge flocculose, white. Stipe 27–39 × 2.0–4.0 mm, equal, partially hollow to hollow, surface pruinose at the apex, below appressed fibrillose, longitudinally striate, yellow (2.5Y 8/6) to olive-yellow (2.5Y 6/6). Cortina present, white to yellow. Context thin in pileus, cream; cream to pale yellow in stipe. Odor strong, spermiatic to iodoform-like. Taste not distinctive, astringent. IS = 9.8–24.1. ISB = 60.8–313.9.

Chemical reactions: Pileus—FeCl₃ immediately olive, slowly blackening within 5 h; KOH immediately darkening slightly; NH₄OH negative; aniline slowly reddening within 5 h; phenol reddening within 20 min. Lamellae—FeCl₃ gradually olive within 20 min; KOH negative; NH₄OH negative; aniline slowly reddening within 5 h; phenol slowly red-

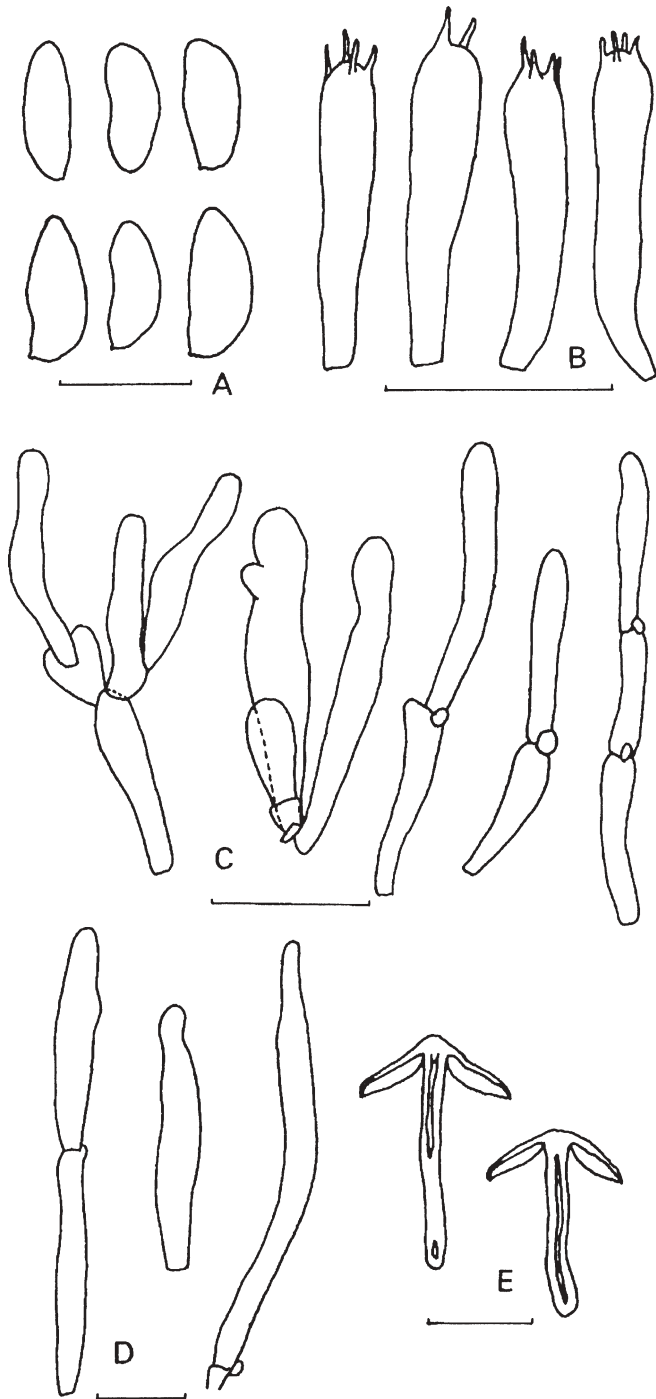


Fig. 1. *Inocybe malenconii* R. Heim var. *cylindrata* Takah. Kobay. **A** Spores. **B** Basidia. **C** Cheilocystidia. **D** Caulocystidia on stipe apex. **E** Carpophores. Bars **A** 10 µm; **B–D** 20 µm; **E** 20 mm

dening within 20 min. Stipe—FeCl₃ immediately very pale olive, becoming more intense within 20 min; KOH negative; NH₄OH faintly yellow after 20 min; aniline slowly flesh color within 20 min; phenol reddening within 20 min.

Spores 8.0–11.5(–13.0) × 4.5–6.0 µm, range of average value 9.9–11.9 × 4.9–5.4 µm, $Q = (1.6–)2.0–2.7$, subphaseoliform to amygdaliform in side view, oblong in front view, smooth, yellowish-brown to orange-brown. Basidia 26–30 × 6.4–8.0 µm, 4-spored, occasionally 2-spored, narrowly clav-

ate, with pale lemon-yellow contents. Pleurocystidia absent. Cheilocystidia often catenate, thin-walled, with terminal cells 32–43 × 7.5–11.3 µm, narrowly cylindrical to narrowly clavate, slightly yellow. Hymenophoral trama subregular to regular, hyphae 3.8–7.5 µm diameter. Caulocystidia present at the apex of stipe only, similar to cheilocystidia in shape, catenate, total length up to 98 µm, terminal cells 53–62(–94) × 7.2–14.4 µm, cylindrical, thin-walled, scarce. Pileipellis a trichoderm, of hyphae 3.8–12.5 µm diameter, up to 230 µm long, walls somewhat thickened, filled with orange-brown pigment; the subtending layer up to 228 µm thick, composed of subregular hyphae 3.8–8.8 µm diameter, very pale yellow. Clamp connections abundant in all tissues but not always at septa.

Habitat, distribution, and season: On soil under *Quercus acutissima* Carruth., *Q. serrata* Thunb. ex Murray, *Q. myrsinaefolia* Blume, *Carpinus tschonoskii* Maxim., *Castanopsis sieboldii* (Makino) Hatus. ex T. Yamaz. & Mashiba, and *Pinus densiflora* Siebold & Zucc.; Japan, Chiba Pref., known only from the type locality; June–September.

Specimens examined: Japan: Chiba Pref., Chiba-shi, Wakaba-ku, Tabeta-cho, Heiwa Park, June 18, 1995, collected by K. Oosaku, FB 12713 (CBM); Sept. 5, 1998 collected by T. Kobayashi., TAKK 98.9.5.1; June 27, 1999, collected by K. Oosaku & T. Kobayashi, TAKK 99.6.27.106-1 (holotype, SAPA), FB 34138 (isotype, CBM); June 27, 1999, collected by T. Kobayashi, TAKK 99.6.27.107 (SAPA); July 18, 1999, collected by T. Kobayashi, TAKK 99.7.18.100 (SAPA); June 17, 2000, collected by T. Kobayashi, TAKK 00.6.17.1 (SAPA).

Etymology: from Latin *cylindratus* (=cylindrical), referring to the cylindrical cheilocystidia.

Japanese name: Heiwa-tomayatake (n. n.).

Remarks: This variety belongs to the subgenus *Inosperma* section *Dulcamarae*. *Inocybe malenconii* var. *cylindrata* is characterized by its narrowly cylindrical cheilocystidia, subphaseoliform to amygdaliform spores, and the pileipellis consisting of a trichoderm. The type variety (var. *malenconii*) is different in having broadly ellipsoid cheilocystidia (Stangl and Bresinsky 1983; Alessio and Rebaudengo 1980). *Inocybe malenconii* var. *cylindrata* resembles *I. heimii* Bon (Bon 1984) in spore characters, but the latter exhibits a larger basidiocarp with stipe bushy-fibrillose at the lower portion.

Section *Rimosae* (Fr.) Sacc.

Inocybe reisneri Velen., České Houby: 384, 1920.

Figs. 2, 7B
=*Inocybe insignissima* Romagn., Sydowia Beiheft 8: 350, 1979.

Selected Icones: Stangl, Beitr. Kenntn. Pilze Mitteleuropas 1, pl. 3. 1984 (as *I. insignissima* Romagn.); Stangl, Hoppea 46, pl. 5/3. 1989.

Pileus 22–31 mm, paraboloid when young, then convex, umbonate with squarrose disk, margin smooth, outer margin rimulose; color very pale brown (10YR 7/4) to yellowish-brown (10YR 5/6), sometimes covered with a white velipellis. Lamellae adnexed to sinuate, close, brown

(10YR 5/3) to yellowish-brown (10YR 5/4), with white flocculose edges. Stipe 22–31 × 4.0–4.5 mm, equal above the abruptly bulbous to marginately bulbous base; surface striped, apex pruinose; solid; pale violet throughout when young, and later violet at the apex, white at the base. Cortina present. Context thin in the pileus, white; striped in the stipe, pale violet at apex and cream at base. Odor strong, fruitlike to soaplike. Taste not distinctive. IS = 12.0–15.1. ISB = 54.0–102.5.

Chemical reactions: Not examined.

Spores 7.0–10.5 × 4.5–5.8 μm, range of average value 8.1–9.2 × 5.0–5.3 μm, $Q = 1.4–2.0$, smooth, ellipsoid to subphaseoliform in side view, oblong in frontal view, yellowish-brown. Basidia 24–29 × 8.8–10 μm, 4-spored, narrowly clavate to clavate, slightly yellow. Pleurocystidia absent. Cheilocystidia 35–48 × 11.3–18.8 μm, pyriform to broadly clavate, thin-walled, very pale yellow. Caulocystidia present at apex only, 26–37 × 8.4–15.6 μm, cylindrical to fusiform, thin-walled, very pale yellow, with slightly yellow content, rather abundant. Cauloparacystidia mixed with caulocystidia at apex, often catenate, terminal cells up to 18 × 10.8 μm, cylindrical, thin-walled, very pale yellow, rather abundant. Pileipellis composed of interwoven hyphae, two-layered; the uppermost layer up to 320 μm thick, consisting of irregular hyphae 2.5–8.0 μm diameter, very pale yellow; the subtending layer up to 460 μm thick, of hyphae 3.5–9.5 μm diameter, orange-brown. Clamp connections abundant in all tissues but not always at septa.

Habitat, distribution, and season: On soil in *Quercus myrsinaefolia* and *Styrax japonicus* Siebold & Zucc. forest; *Cryptomeria japonica* (L.f.) D. Don and *Castanopsis sieboldii* dominant forest; *Carpinus tschonoskii* Maxim., *Quercus serrata* Thunb. ex Murray and *Q. myrsinaefolia* Blume forest; *Larix kaempferi* (Lamb.) Carrière forest; Japan (Chiba Pref., Tokyo and Nagano Pref.), July–October. Also in Europe.

Specimens examined: Japan: Chiba Pref., Funabashi-shi, Funabashi-kenmin-no-mori, July 11, 1999, collected by K. Oosaku, TAKK 99.7.11.9-1, July 11, 1999, collected by Takah. Kobayashi, TAKK 99.7.11.9-2 (SAPA); July 17, 1999, collected by K. Oosaku, TAKK 99.7.17.1 (SAPA); Noda-shi, Oct. 18, 2001, collected by T. Kobayashi, TAKK 01.10.18.3 and TAKK 01.10.18.10; Nagano Pref., Minamisaku-gun, Nobeyama, Sept. 2, 1999, collected by T. Hashimoto & A. Oguchi, TAKK 99.9.2.1.

Japanese name: Usu-murasaki-tomayatake (n. n.).

Remarks: This species belongs to the subgenus *Inosperma* section *Rimosae* for its smooth spores, thin-walled cheilocystidia, and absence of pleurocystidia. *Inocybe reisneri* is characterized by the violet stipe apex, abruptly to marginately bulbous stipe base, and thin-walled cheilocystidia.

The Japanese collections mostly coincide with European collections reported by Velenovský (in Pilát 1948) and Kuyper (1986), except the presence of cortina, which was not observed by Kuyper (1986).

Inocybe reisneri is close to *I. quietiodor* Bon by its broadly clavate cheilocystidia and ellipsoid spores, but the latter lacks a violet tint in the stipe.

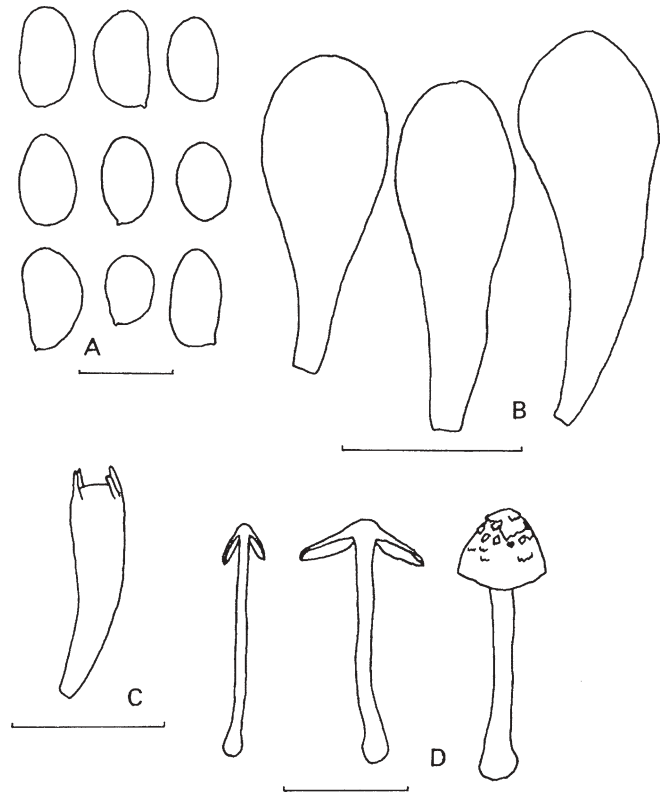


Fig. 2. *Inocybe reisneri* Velen. A Spores. B Cheilocystidia. C Basidium. D Carpophores. Bars A 10 μm; B, C 20 μm; D 20 mm

Subgenus *Inocibium* (Earle) Singer

Section *Tardae* Bon

Inocybe fuscidula Velen., České Houby: 378, 1920 (non-*Inocybe fuscidula* Bres., Iconogr. Mycol. IV: 735, pl. 735, 1930).

Fig. 3

=*Inocybe descissa* (Fr.) Quél. var. *brunneoatra* R. Heim, Le genre *Inocybe*: 234, fig. 154, 1931.

=*Inocybe brunneoatra* (R. Heim) P.D. Orton, Trans. Br. Mycol. Soc. 43: 177, 1960.

Selected Icones: R. Heim, Le genre *Inocybe*, pl. 20/1, 1931 (as *I. descissa* var. *brunneoatra*); J. Lange, Fl. Agar. Dan. 3: pl. 113/A, 113/A1, 1938 (as *I. descissa* var. *brunneoatra*); Stangl, Hoppea 46: pl. 17/1, 1989.

Pileus up to 30 mm, convex, subumbonate, surface smooth, rimulose, satiny; margin yellowish to dark yellowish-brown (10YR 5-4/4); disk dark yellowish-brown (10YR 3/4). Lamellae adnexed, close, dark yellowish-brown (10YR 3-4/6) with fimbriate, white to pale brown edges. Stipe up to 33 × 5 mm, equal with a somewhat swollen base (up to 5.5 mm), solid; apex pruinose, lower portion striate; white (10YR 8/1). Context thin in pileus, white; white to very pale brown (10YR 8/3) in stipe. Odor strong, fungoid. Taste not distinctive.

Chemical reactions: Not examined.

Spores 7.0–10.5 × 4.5–6.5 μm, on average 9.5 × 5.8 μm, $Q = 1.5–1.9$, amygdaliform in side view, ellipsoid in frontal view, smooth, yellowish-brown to orange-brown. Basidia

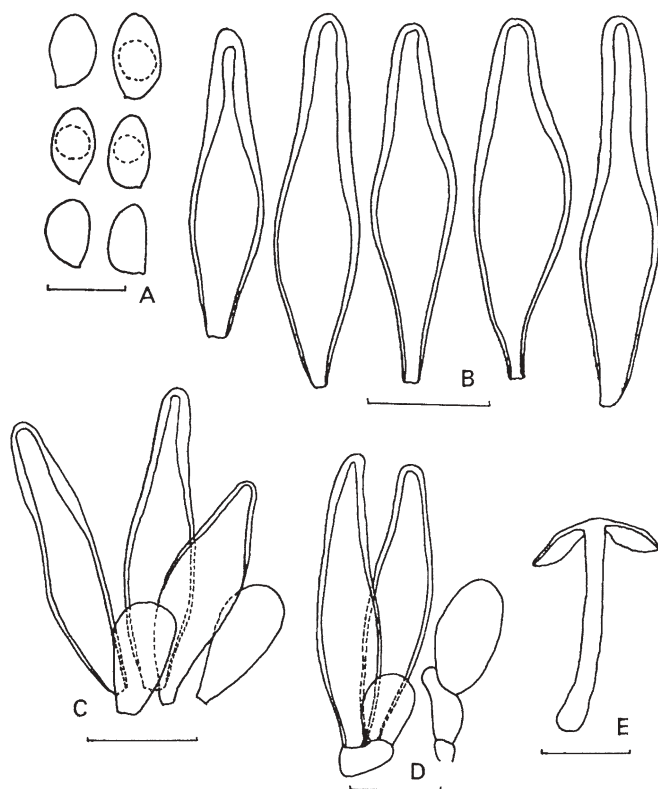


Fig. 3. *Inocybe fuscidula* Velen. **A** Spores. **B** Pleurocystidia. **C** Cheilocystidia (metuloids and paracystidia). **D** Caulocystidia (metuloids and paracystidia) on stipe apex. **E** Carpophore. Bars **A** 10µm; **B–D** 20µm; **E** 20mm

26–30 × 8.8–10.0µm, 4-spored, cylindrical to clavate, with pale yellow pigment. Pleurocystidia as metuloids, 58–74 × 13.8–20.0µm, ventricose to fusiform with a cylindrical neck, thick-walled (up to 3.0µm), pale yellow with pale brown contents. Cheilocystidia of two types: (1) metuloids similar to pleurocystidia; (2) paracystidia broadly clavate, thin-walled, pale yellow with slightly brown contents, very abundant. Hymenophoral trama subregular, hyphae 6.0–11.5µm diameter, often swollen, up to 28µm diameter, pale yellow. Caulocystidia present at the apex only and of two types: (1) thick-walled metuloids similar to pleurocystidia, 59–88 × 14.4–22.8µm; (2) paracystidia sometimes catenate, with terminal cells up to 26 × 14.4µm, broadly ellipsoid, thin-walled, almost hyaline. Pileipellis a cutis, two-layered; the uppermost layer up to 98µm thick, composed of subparallel hyphae 4.5–11.5µm diameter, pale yellow; the subtending layer up to 153µm thick, of subparallel hyphae 4.5–7.0(–16.0)µm diameter, orange-brown to gray-brown. Clamp connections abundant in all tissues but not always at septa.

Habitat, distribution, and season: On soil in *Larix kaempferi* forest; central Japan (Nagano Pref.), also in Europe and North America; September.

Specimen examined: Japan: Nagano Pref., Minamisakugun, Nobeyama, Sept. 1, 1999, collected by A. Oguchi & T. Hashimoto, TAKK 99.9.1.1 (SAPA).

Japanese name: Seiyo-tomayatake (n. n.).

Remarks: This species belongs to the subgenus *Inocybium* section *Tardae*, because it has smooth spores, metuloids both in the hymenium and the stipe apex, and a smooth surface in the pileus.

The Japanese collection coincides well with *I. fuscidula* reported by Kuyper (1986), although Kuyper (1985, 1986) illustrates spores with a slightly more pointed apice from the type specimen and other European materials.

Inocybe pseudodestructa Stangl & J. Veselský, *Česká Mykol.* 27: 18, pl. 83/3, 1973.

Figs. 4, 7C

Selected Icons: Bres., *Iconogr. Mycol.* IV: pl. 740. 1930 (as *I. destructa*); Stangl & Veselský, *Česká Mykol.* 27: pl. 83/3. 1973; Alessio & Rebaudengo, *Iconogr. Mycol.* 29: pl. 49. 1980 (as *I. destructa*); Stangl, *Hoppea* 46: pl. 14/1. 1989.

Pileus 19–41 mm, convex when young, then applanate, subumbonate; surface smooth, rimulose to rimose, satiny; margin light yellowish-brown (10YR 6/4) to yellowish-brown (10YR 5/6); umbo dark brown (7.5YR 4/6). Lamellae adnexed to sinuate, close, very pale brown (10YR 7/3–4) when young, later grayish-brown with fimbriate white edges. Stipe 52–68 × 3.5–7.5 mm, more or less equal above somewhat swollen base, solid; surface pruinose at apex, smooth below, satiny, striate, color pink (7.5YR 8/4). Context thin in pileus, white; striate in stipe, pink to pale brown. Odor strong, spermatic. Taste fungoid. IS = 14.2–40.7. ISB = 110.0–524.2.

Chemical reactions: Pileus—FeCl₃ immediately olive, black within 15 min; KOH (30%) slowly dark brown within 15 min. Lamellae—FeCl₃ dark olive within 15 min; KOH (30%) negative. Stipe—FeCl₃ negative, KOH (30%) yellow within 15 min.

Spores (7.0–)8.0–13.0 × 4.5–7.0µm, range of average values 8.1–10.6 × 4.8–6.2µm, *Q* = 1.5–2.0, smooth, amygdaliform with subacute apex in side view, ovoid in frontal view, yellowish-brown. Basidia 24–33 × 7.5–10.0µm, 4-spored, narrowly clavate, very pale yellow. Pleurocystidia as metuloids, 59–80 × 13.8–18.8µm, ventricose to fusiform, thick-walled (up to 4.0µm), very pale yellow, sometimes with pale brown contents. Cheilocystidia as thick-walled metuloids similar to pleurocystidia; intermixed with abundant thin-walled paracystidia, pale yellow, with pale brown contents, rarely catenate with terminal cells 25–33 × 11.3–17.5µm, broadly clavate. Hymenophoral trama subregular, hyphae 9.0–12.0µm diameter, sometimes swollen, up to 20µm diameter, almost hyaline. Caulocystidia of two types: (1) thick-walled metuloids descending down 1/3 of the stipe length, 54–79 × 15.0–23.8µm, ventricose to fusiform, not originating from stipe trama, (2) paracystidia thin-walled, pale yellow with pale brown contents, sometimes catenate with broadly clavate terminal cells. Pileipellis a subparallel cutis, the uppermost layer up to 33µm thick, hyphae 2.5–7.5µm diameter, pale yellow; the subtending layer up to 43µm thick, hyphae 1.3–6.3µm diameter, orange-brown. Clamp connections abundant in all tissues but not always at septa.

Habitat, distribution, and season: On soil in *Larix kaempferi* forest; central Japan (Kanagawa Pref. and Nagano Pref.); also in Europe; June–October.

Specimens examined: Japan: Nagano Pref., Minamisakugun, Nobeyama, Oct. 1, 1999, collected by T. Kobayashi, TAKK 99.10.1.2, TAKK 99.10.1.3 & 5 (SAPA) and FB 30735 (CBM); Oct. 2, 1999, collected by Takah. Kobayashi, TAKK 99.10.2.2 & 3 (SAPA) and TAKK 99.10.2.7; Oct. 17, 1999, collected by A. Suzuki, FB 34139 (CBM), TAKK 99.10.17.2 & 4 and TAKK 99.10.17.5 (SAPA).

Japanese name: Kagayaki-tomayatake (n. n.).

Remarks: This species belongs to the subgenus *Inocybium* section *Tarda*. The smooth spores, the metuloids in the hymenium and stipe apex, and the smooth surface of the pileus are typical features of the section *Tarda*.

Present collections coincide well with *I. pseudodistricta* reported by Stangl and Veselský (1973) and Kuyper (1986). The author examined the type specimen of *I. pseudodistricta* from Czechoslovakia (Ostrava, Aug. 30, 1970, collected by J. Veselský, PRM 716231, holotype) and found that its salient features closely matched the Japanese specimens, although the type had somewhat broader pleurocystidia of $54\text{--}66 \times 14.4\text{--}20.4\mu\text{m}$.

The first record of *I. pseudodistricta* in Japan was given by Kobayashi (2002b) from the material collected in Kanagawa Prefecture, but only with microscopic information.

Subgenus *Inocybe*

Section *Marginatae* Kühner

Inocybe magnicarpa Takah. Kobay., sp. nov.

Figs. 5, 7D

Pileo 32–71 mm lato, applanato, subumbonato, fibrilloso, rimuloso, cinereo-brunneo, squamis luteo-brunneis praedito; lamellis adnexis, luteo-brunneolis; stipite 24–74 × 6.5–10.5 mm, basi bulboso vel submarginato, solido, flavido vel pallide brunneo, pruinoso; carne cremea; sporis 6.5–9.0 × 5.0–7.5 μm, nodulosus, luteo-brunneis; basidiis 24–28 × 8.3–9.5 μm, tetrasporis; pleurocystidiis 45–70 × 14.5–27.0 μm, fusiformibus, pachydermicis; cheilocystidiis 46–65 × 16.3–22.5 μm, fusiformibus, ventricosis, pachydermicis; caulocystidiis pachydermicis, stipite omnine praesentibus. Holotypus: TAKK 00.7.16.9-1 (SAPA).

Pileus 32–71 mm broad, paraboloid with inflexed margin when young, then applanate, subumbonate; surface fibrillose, rimulose at margin, appressed scaly around the disk over narrow zone; color grayish to dark grayish-brown (10YR 5–4/2) overall, with yellowish to dark yellowish-brown (10YR 5–4/4) scales. Lamellae subventricose, adnexed, close; white (2.5Y 8/2) when young, then light gray (2.5Y 7/2) to light yellowish-brown (2.5Y 6/4); edges flocculose, white. Stipe 24–74 × 6.5–10.5 mm, equal with a bulbous or submarginate base (up to 23.5 mm diameter), solid; surface pruinose overall, not fibrillose, yellowish to very pale brown (10YR 7/4) below white apex. Cortina absent. Context rather thin in pileus, white; cream in stipe, striate. Odor strong, spermatic. Taste grassy. IS = (1.8–)4.7–19.8. ISB = 90.8–140.0.

Chemical reactions: Pileus—FeCl₃ gradually olive-green within 20 min; KOH negative; aniline slowly dull red within 3.5 h; phenol slowly red within 1 h. Lamellae—FeCl₃ gradually olive within 20 min; KOH gradually pale yellow within

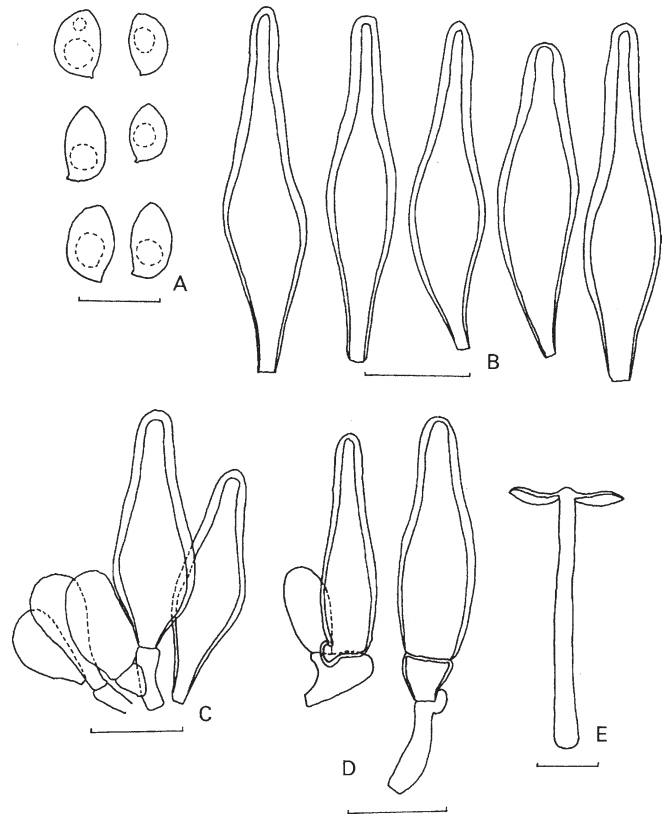


Fig. 4. *Inocybe pseudodistricta* Stangl & J. Veselský. **A** Spores. **B** Pleurocystidia. **C** Cheilocystidia (metuloids and paracystidia). **D** Caulocystidia (metuloids and paracystidium) on stipe apex. **E** Carpo-phore. Bars **A** 10 μm; **B–D** 20 μm; **E** 20 mm

20 min; aniline slowly dull red within 3.5 h; phenol negative. Stipe—FeCl₃ gradually olive-green within 20 min; KOH negative; aniline negative; phenol slowly reddening within 1 h.

Spores 6.5–9.0 × 5.0–7.5 μm, range of average value 7.9–8.4 × 5.7–6.8 μm, $Q = (1.0\text{--})1.2\text{--}1.5$, elliptical-nodulose, with 7–10 small nodules, yellowish-brown. Basidia 24–28 × 8.3–9.5 μm, 4-spored, cylindrical to clavate, very pale yellow. Pleurocystidia as thick-walled (up to 6.0 μm) metuloids, 45–70 × 14.5–27.0 μm, fusiform with a short pedicel, very pale yellow. Cheilocystidia of two types: (1) thick-walled metuloids, 46–65 × 16.3–22.5 μm, fusiform to broadly fusiform, ventricose or broadly ventricose, very pale yellow; (2) paracystidia very abundant, often catenate, total length up to 30 μm long, terminal cells 16–20 × 5.0–11.3 μm, ellipsoid, thin-walled, very pale yellow. Hymenophoral trama subregular, hyphae 2.0–5.8 (–8.0) μm diameter, rarely swollen, up to 14.5 μm diameter. Caulocystidia of two types: (1) thick-walled metuloids present overall the stipe surface, at stipe apex 48–70 × 12.5–20 μm, ventricose, often with a truncate base, rarely with a short pedicel, very pale yellow, at stipe base narrowly ventricose to fusiform; (2) thin-walled paracystidia abundant and often in clusters with metuloids, often catenate; terminal cells at stipe apex 18–29 × 5.8–8.8 μm, cylindrical to narrowly clavate, and hyaline, those at stipe base 11–33 × 5.0–10.0 μm and ovoid to cylindrical. Pileipellis an irregular duplex, the uppermost layer up to

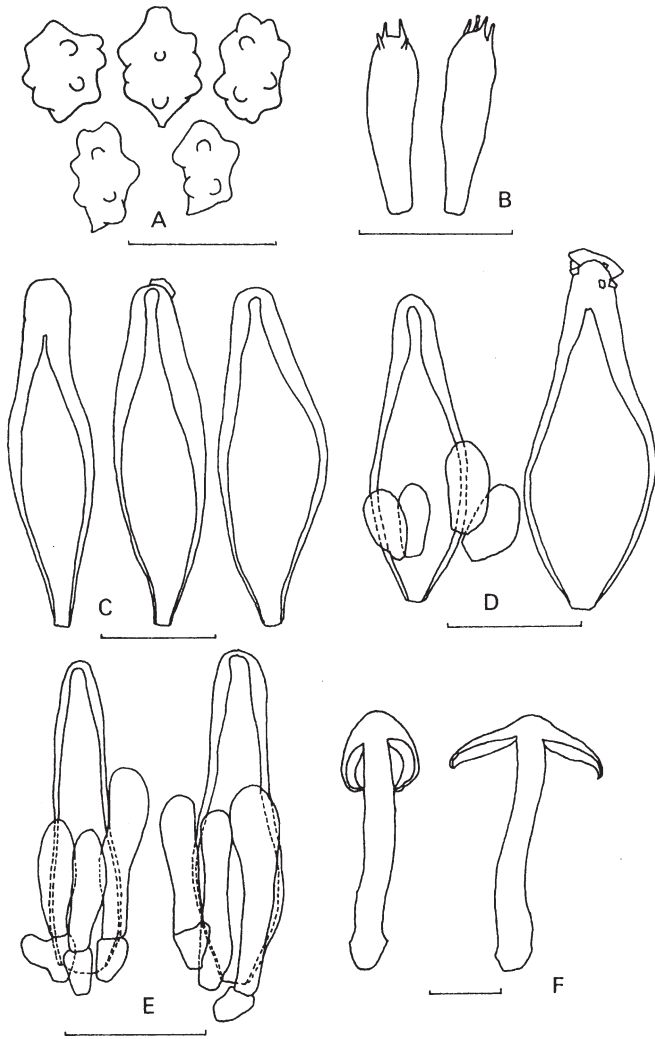


Fig. 5. *Inocybe magnicarpa* Takah. Kobay. **A** Spores. **B** Basidia. **C** Pleurocystidia. **D** Cheilocystidia (metuloids and paracystidia). **E** Caulocystidia (metuloids and paracystidia) on stipe apex. **F** Carpophores. Bars **A** 10 μ m; **B–E** 20 μ m; **F** 20mm

143 μ m thick, consisting of hyphae 2.5–6.3 μ m diameter, very pale yellow; the subtending layer up to 68 μ m thick, pale grayish-brown. Clamp connections present in all tissues but not always at septa.

Habitat, distribution, and season: On soil in *Quercus myrsinaefolia*, *Q. serrata*, *Q. acutissima*, *Carpinus tschonoskii*, and *Cryptomeria japonica* forest; *Chamaecyparis pisifera* (Siebold & Zucc.) Endl. and *Quercus myrsinaefolia* forest; central Japan (Chiba Pref.); July–October.

Specimens examined: Japan: Chiba Pref., Chiba-shi, Wakaba-ku, Izumi Natural Park, July 16, 2000, collected by T. Kobayashi, TAKK 00.7.16.9-1 (holotype, SAPA), FB 34137, (isotype, CBM) and TAKK 00.7.16.10 (SAPA); Sept. 30, 2000, collected by A. Iijima, TAKK 00.9.30.2 (SAPA); Sept. 30, 2000, collected by T. Kobayashi, TAKK 00.9.30.3–5 (SAPA); Sept. 30, 2000, collected by R. Onuma, FB 30736 (CBM); Funabashi-shi, Funabashi-kenminno-mori, July 23, 2000, collected by T. Kobayashi & K.

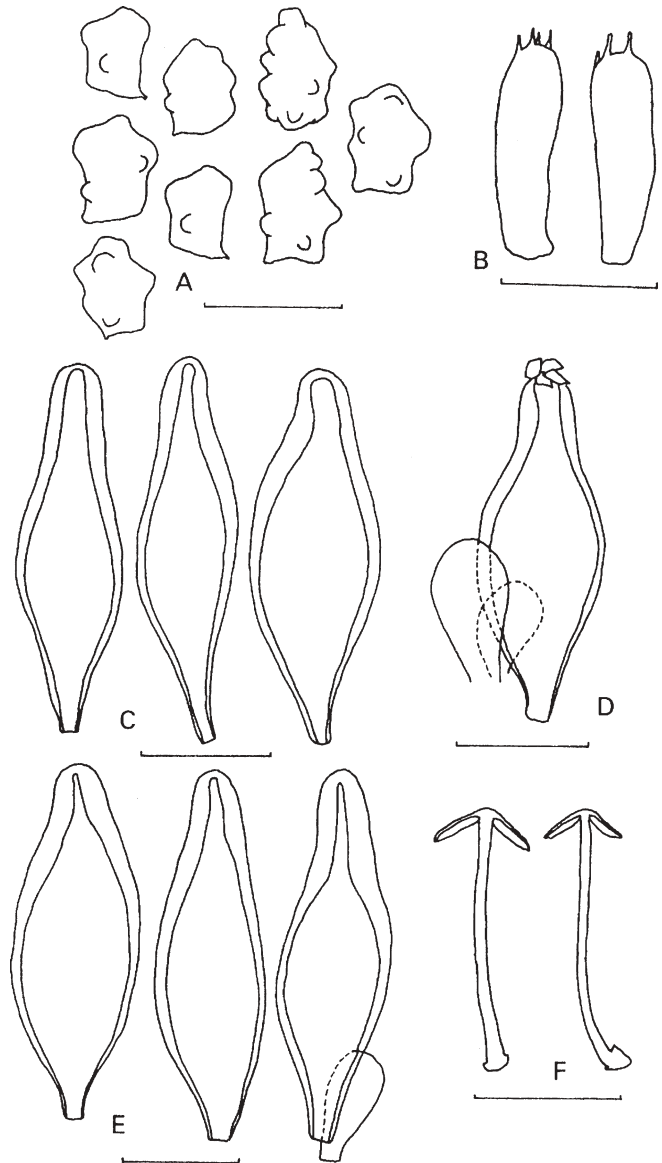


Fig. 6. *Inocybe brunneorufa* Stangl & J. Veselský var. *angusta* Takah. Kobay. **A** Spores. **B** Basidia. **C** Pleurocystidia. **D** Cheilocystidium (metuloid and paracystidium). **E** Caulocystidia (metuloids and paracystidium) on stipe apex. **F** Carpophores. Bars **A** 10 μ m; **B–E** 20 μ m; **F** 20mm

Oosaku, TAKK 00.7.23.50; Oct. 14, 2000, collected by T. Kobayashi, TAKK 00.10.14.8 (SAPA).

Etymology: From Latin *magnus* (=large) and *carpo* (=fructed), referring to the large basidiocarps.

Japanese name: Ookobumino-tomayatake (n. n.).

Remarks: This species belongs to subgenus *Inocybe*, section *Marginatae*. The metuloid caulocystidia present overall, the bulbous or submarginate stipe base, and the nodulose spores are typical features of the section *Marginatae*.

Inocybe magnicarpa appears to be most closely allied to *I. trivialis* (J. E. Lange) M.M. Moser, but the latter has more irregular, longer spores of 9–13 μ m as described by Lange (1917), Heim (1931), and Alessio and Rebaudengo (1980).



Fig. 7. Carpophores of *Inocybe* taxa. **A** *Inocybe malenconii* var. *cylindrata*. **B** *Inocybe reisneri*. **C** *Inocybe pseudodestructa*. **D** *Inocybe magnicarpa*. Bars 20 mm

Inocybe fibrosa (Sowerby) Gillet sensu Bresadola is similar to *I. magnicarpa* in having nodulose spores and a large basidiocarp. However, the original description of *Agaricus fibrosus* Sowerby (Sowerby 1803) suggests that the fungus is a fox-colored *Cortinarius*. In addition, Dumée (1912) illustrated *I. fibrosa* as having rough surfaces of spores. Unfortunately, the type collection of *A. fibrosus* does not exist in Kew herbarium. Thus, the interpretation of *I. fibrosa* by Bresadola (1881) is doubtful and is not accepted in this work. *Inocybe fastuosa* Takah. Kobay. also resembles *I. magnicarpa*, but in *I. fastuosa* the stipe base is subbulbous, the nodules of the spores are larger, the caulocystidia are absent at the basal part of stipe, and the stipe turns pale yellow in KOH (Kobayashi 1995). *Inocybe magnicarpa* may be confused with *I. praetervisa* Quél. apud Bres., but the latter is distinctive in having a yellow rimulose pileus, a white stipe with a typically marginate bulb and larger spores, $10\text{--}11 \times 5\text{--}6\ \mu\text{m}$ (Bresadola 1881), $9\text{--}12.5 \times (6.5\text{--}7\text{--}8\text{--}9)\ \mu\text{m}$ (Stangl 1989).

Inocybe brunneorufa Stangl & J. Veselský (Česká Mykol. 25: 5. 1971) var. ***angusta*** Takah. Kobay., var. nov.

A typo differt pleurocystidiis angustioribus, collo longioribus et septis minoribus incrassatis. Holotypus: TAKK 00.7.1.7 (SAPA).

Fig. 6

Pileus 16–26 mm broad, obtusely conical, surface smooth, rimulose, reddish-brown (5YR 4/3) to dark reddish-brown (5YR 3/4). Lamellae adnexed, close, light yellowish-brown to yellowish-brown (10YR 6–5/4) with white flocculose edges. Stipe $34\text{--}55 \times 1.5\text{--}3.5\ \text{mm}$, equal with a marginately bulbous base (up to 7.5 mm diameter), solid, entirely pruinose, satiny, very pale brown (10YR 8/3–4). Cortina not observed. Context thin in pileus, pure white; striate in stipe, satiny, very pale brown (10YR 8/3 to 7/4), pure white in base of stipe. Odor strong, subspermatic. Taste bitter. IS = 25.7–67.1. ISB = 218.4–530.1.

Chemical reactions: Pileus— FeCl_3 olive immediately; KOH negative; aniline negative; phenol reddish pigment slowly exuded within 20 min. Lamellae— FeCl_3 slowly olive within 20 min; KOH negative; aniline negative; phenol negative. Stipe— FeCl_3 very slowly olive within 75 min; KOH slowly pale yellow within 20 min; aniline negative; phenol negative.

Spores $6.8\text{--}9.8 \times 5.3\text{--}7.5\ \mu\text{m}$, range of average value $7.8\text{--}8.3 \times 6.2\text{--}6.8\ \mu\text{m}$, $Q = (1.0\text{--})1.1\text{--}1.4(-1.6)$, elliptical nodulose, with 5–10 nodules, yellowish-brown. Basidia 21–28 \times 8.3–10 μm , 4-spored, narrowly clavate to cylindrical, very pale yellow. Pleurocystidia as thick-walled (up to 5.0 μm) metuloids, 53–69 \times 17–25.8 μm , fusiform to broadly ventricose with a short pedicel, faint to pale yellow, rarely containing pale brown intracellular pigment. Cheilocystidia of two types: (1) thick-walled, slightly yellow metuloids similar

to pleurocystidia; (2) abundant thin-walled paracystidia, often catenate with terminal cells $13\text{--}15 \times 8.3\text{--}11.3\ \mu\text{m}$, ellipsoid to broadly spatulate, very pale yellow. Hymenophoral trama parallel, hyphae $2.5\text{--}7.0\ \mu\text{m}$ diameter, often swollen and up to $31\ \mu\text{m}$ diameter. Caulocystidia also of two types: (1) thick-walled, faint yellow metuloids descending to base, at stipe apex $53\text{--}70 \times 16.3\text{--}23.8\ \mu\text{m}$, ventricose to broadly fusiform with a short pedicel, at stipe base $34\text{--}53 \times 10\text{--}25\ \mu\text{m}$, ventricose to broadly fusiform with or almost lacking a short pedicel; (2) thin-walled, faint yellow paracystidia, abundant and often clustered with caulocystidia, sometimes catenate; terminal cells at stipe apex $16\text{--}24 \times 7.5\text{--}10.8\ \mu\text{m}$, ellipsoid to clavate, at stipe base $15\text{--}36 \times 5\text{--}12.5\ \mu\text{m}$, obovoid. Pileipellis a subregularly arrayed cutis, duplex; uppermost layer up to $51\ \mu\text{m}$ thick, hyphae $2.8\text{--}4.5\ \mu\text{m}$ diameter, sometimes swollen to $9.5\ \mu\text{m}$ diameter, nearly hyaline to pale brown; subtending layer up to $19\ \mu\text{m}$ thick, hyphae $2.0\text{--}6.0\ \mu\text{m}$ diameter, sometimes swollen to $10.5\ \mu\text{m}$ diameter, yellowish-brown to brown. Clamp connections present.

Habitat, distribution, and season: On soil in mixed or deciduous forests; central Japan (Chiba Pref.), July.

Specimens examined: Japan: Chiba Pref., Narita-shi, Fudoki-no-oka, July 1, 2000, collected by T. Takahashi, TAKK 00.7.1.7 (HOLOTYPE, SAPA); the same place, July 1, 2000, collected by T. Kobayashi, TAKK 00.7.1.4.

Etymology: From Latin *angustus* (= narrow), referring to the narrow basidiocarps.

Japanese name: Enaga-tomayatake (n. n.).

Remarks: *Inocybe brunneorufa* belongs to the subgenus *Inocybe*, section *Marginatae*. The marginately bulbous stipe base, thick-walled caulocystidia present overall, metuloid pleurocystidia and cheilocystidia, and the nodulose spores are typical characters of the section *Marginatae*. *Inocybe brunneorufa* var. *angusta* agrees with *I. brunneorufa* reported by Stangl and Veselský (1971). However, the author's examination of the isotype of *I. brunneorufa* var. *brunneorufa* (Augsburg, June 20, 1966, collected by Stangl & J. Veselský, PRM 687133) revealed that it has broader metuloids with a shorter neck and their walls are more thickened.

According to Kuyper (1985), *I. calida* Velen. is the same with *I. brunneorufa*. However, Alessio (1994) disagrees with this synonymy by Kuyper (1985). The author also disagrees with Kuyper's treatment, accepting *I. calida* as an autonomous species.

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