

Toshiyuki Tokiwa · Toru Okuda

Japanese species of *Hypomyces* and its anamorph III

Received: September 6, 2004 / Accepted: May 20, 2005

Abstract Three new species of *Hypomyces* with KOH-negative subiculi occurring on the Aphyllophorales are described. *Hypomyces pseudocorticiicola* is characterized by a grayish-yellow to brown subiculum, fusiform ascospores, always with one septum, and its *Cladobotryum*-anamorph. *Hypomyces laeticolor* is characterized by a bright-colored subiculum, small apiculi on the ascospores, and well-developed verticillate conidiogenous cells. *Hypomyces penicillatus* forms a *Trichothecium*-like anamorph with well-developed verticils of conidiogenous cells.

Key words *Cladobotryum* · Fungicolous fungi · *Hypomyces* · KOH negative · Polyporicolous · *Trichothecium*

Introduction

Polyporicolous *Hypomyces* and its related species have extensively been studied by Põldmaa (1996, 1999, 2003), Põldmaa and Samuels (1999), Põldmaa et al. (1997), and Rogerson and Samuels (1993). Although the known species are mostly KOH negative, i.e., the subiculi do not change their color to red-purple with KOH solution, Japanese reports have so far been limited to either KOH-positive species or anamorphs (Matsushima 1975; Tubaki 1955, 1975; Yasuda 1920), except for our previous reports on several *Hypomyces* species new to Japan (Tokiwa and Okuda 2001, 2004). A wider diversity of unknown or undescribed KOH-

negative species of this genus will thus be found in Japan, which are attractive as genetic resources as well as important as an inventory for understanding the biodiversity and host-parasite relationship. We describe herein three new KOH-negative *Hypomyces* species, all of which have been found on polypores.

Materials and methods

Japanese materials were all collected in eastern Japan since 1999. The herbarium materials were deposited at Kanagawa Prefectural Museum of Natural History, Odawara, Japan (KPM-NC). Living cultures were deposited at Japan Collection of Microorganisms, Wako, Japan (JCM), NITE Biological Resource Center, National Institute of Technology and Evaluation, Kisarazu, Japan (NBRC), and Tamagawa University Research Institute, Machida, Japan (TAMA). We also compared the following cultures kindly supplied by Gary Samuels of USDA-ARS, USA, and Kadri Põldmaa of University of Tartu, Estonia: *Hypomyces sympodiophorus* Rogerson & Samuels GA 00-105 and *H. albidus* Rehm GJS 90-33 that were sent by Gary Samuels, and *H. semitranslucens* G.R.W. Arnold KP 00-118, *H. polyporinus* Peck KP 00-61, and *H. mycophilus* Rogerson & Samuels KP 00-117 of Kadri Põldmaa. Specimens collected were observed according to the method by Rogerson and Samuels (1993) with 3% KOH when necessary. Ascospores were discharged on plane agar, mounted in lacto-phenol, and measured. At the same time, either single or mass spores were manipulated by using Skerman's micromanipulator and transferred onto potato dextrose agar (PDA) slants. Isolates were observed on PDA, malt extract agar (MEA; Difco), and oatmeal agar (OA; Difco) after incubating at 25°C. Color codes were according to the Munsell color system (Anonymous 1991).

T. Tokiwa (✉)
Environmental Hygiene Inspection Center, N.M.G. Co., Ltd., 2-8-33
Wakamatsu, Fuchu, Tokyo 183-0005, Japan
Tel. +81-42-335-1010; Fax +81-42-335-1301
e-mail: t.tokiwa@n-m-g.co.jp

T. Okuda
Mycology & Metabolic Diversity Research Center, Tamagawa
University Research Institute, Tokyo, Japan

Descriptions

Hypomyces pseudocorticicola Tokiwa & Okuda, sp. nov.

Figs. 1,2

Subiculum effusum, griseo-flavum vel brunneum; hyphae luteolae, 4.0–10.0(–16.0) μm latae, in KOH colore non mutatae. Perithecia subglobosa vel late elliptica, (130–)175–190(–230) μm alta, (170–)175–190(–220) μm lata, semiimmersa, gregaria, luteola vel citrina; papilla conica (65–)80–90(–105) μm alta. Asci cylindrici, (106–)124–134(–148) \times (3.0–)4.0–5.0 μm , octospori, apice paulo incrassati et poro praediti. Ascospores fusiformes, (14.0–)16.0–19.0(–21.0) \times (4.0–)4.5–5.0(–6.0) μm , semper aequaliter bicellulares, hyalinae vel luteolae, clare verrucosae, utrinque apiculatae; apiculi 1.5–3.0 μm longi. Anamorphosis: *Cladobotryum* sp. Coloniae in agaro maltoso celeriter crescentes ad 25°C, floccosae, luteolae vel griseo-

aurantiaca; reversum brunneum; odor leviter mucidus. Conidiophora ex hyphis aeries nascentia, septata, 2–3 ramos irregulariter efferentia, (6.5–)7.5–10.0 μm crassa. Cellulae conidiogenae acropleurogenae, solitariae vel verticillatae, tenuatim lanceolatae, sursum attenuatae, hyalinae. Conidia cylindrica vel oblonga, (12.5–)32.5–37.5(–47.5) \times (5.0–)7.5–9.0(–10.5) μm , (0)2–3(–4)-septata, hyalina, catenis brevibus imbricatis adhaerentia. Chlamydosporae subglobosae vel late ellipticae, brunneo-aurantiaca, 7.5–15.0 μm latae, breviter catenatae, subtiliter verruculosae.

Teleomorph in nature: Subiculum light yellow, grayish-yellow (Munsell 5Y9/6, 5Y8/2) to brown (Munsell 10YR4/4) covering part or entire surface of host hymenium; hymenial hyphae pale yellow (Munsell 5Y9/2), 4.0–10.0(–16.0) μm in width, parenchymatous, septate, thick walled, and KOH(–). Perithecia pale yellow (Munsell 5Y9/2) to light yellow (Munsell 5Y9/6), subglobose to broadly ellipsoidal, (130–)175–190(–230) \times (170–)175–190(–220) μm , borne in groups half-immersed in the mycelia; papilla conical, (65–)80–90(–105) \times 75–90(–115) μm in width. Asci cylindrical, (106–)124–134(–148) \times (5.0–)5.5–6.0(–6.5) μm , 8-spored, with a stalk 16.0–20.0 μm long, forming a pore at the slightly thick-walled apex, 1.5–4.0 μm in width. Ascospores hyaline to pale yellow (Munsell 5Y9/2), fusiform, always equally two celled, (14.0–)16.0–19.0(–21.0) \times (4.0–)4.5–5.0(–6.0) μm , verrucose with prominent warts 0.1–0.5 μm in diameter, apiculate at both ends; apiculi 1.5–3.0 μm long, rounded at the apex.

Characteristics in culture: Colonies on MEA, OA, or PDA grow rapidly to reach 90 mm in diameter after 7 days at 25°C, floccose, pale yellow, light yellow to grayish-orange (Munsell 5Y9/2-6, 10YR8/4), margin uneven, odor slightly moldy, reverse brownish-orange, yellowish-brown to light brown (Munsell 10YR5-7/4-8), forming a loose network of mycelium; mycelium partially composes a dense mat, producing sclerotia, vivid yellow or yellow (Munsell 5Y8/12-14) to pale or light yellow (Munsell 5Y9/2-6), which turn out to be perithecia. Hyphae are hyaline, septate, thick walled, 7.5–12.5(–20.0) μm . Conidiophores borne from aerial hyphae, semimacronematous, septate, slightly thick walled, two to three times branched irregularly, (6.5–)7.5–10.0 μm wide, forming conidiogenous cells at the apex. Conidiogenous cells born laterally or as a main branch of conidiophores, solitary or in a whorl, hyaline, (140–)250–375(–440) \times (2.5–)7.5–9.5 μm , slightly lanceolate, gradually tapered to the apex 2.0–3.0 μm in width. Conidia produced retrogressively in short imbricate chains from the apex of conidiogenous cells, hyaline, (0–)2–3(–4) septate, cylindrical to long ellipsoidal, thin walled, smooth, (12.5–)32.5–37.5(–47.5) \times (5.0–)7.5–9.0(–10.5) μm . Chlamydosporae produced in chains laterally on the substrate hyphae or apically at the apex of the branches, brownish-orange (Munsell 10YR7/4), with minute warts, subglobose to broadly ellipsoidal, 7.5–15 μm in width.

Etymology: Named after *H. corticicola* because of the morphological similarity.

Habitat: Parasitic on polypores.

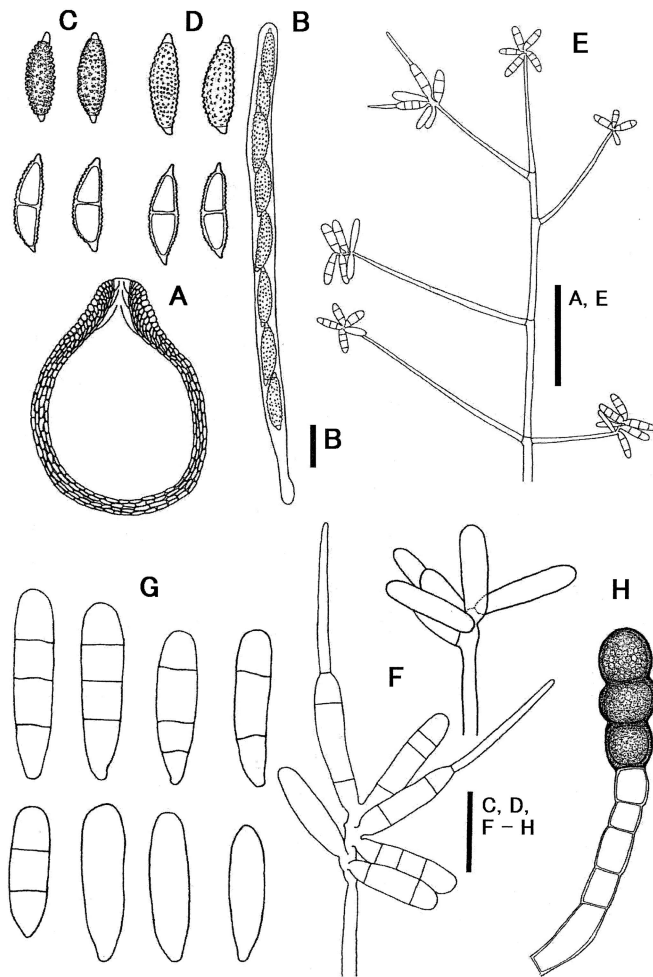


Fig. 1. *Hypomyces pseudocorticicola*. **A–C** Specimen (KPM-NC0009253); **D–H** culture on malt extract agar (MEA) (JCM 12654). **A** Vertical section of a perithecium. **B** Asci. **C** Ascospores. **D** Ascospores. **E** Conidiophore and conidiogenous cells. **F** Conidiogenous cells and conidia. **G** Conidia. **H** Chlamydosporae. Bars **A**, **E** 100 μm ; **B–D**, **F–H** 20 μm

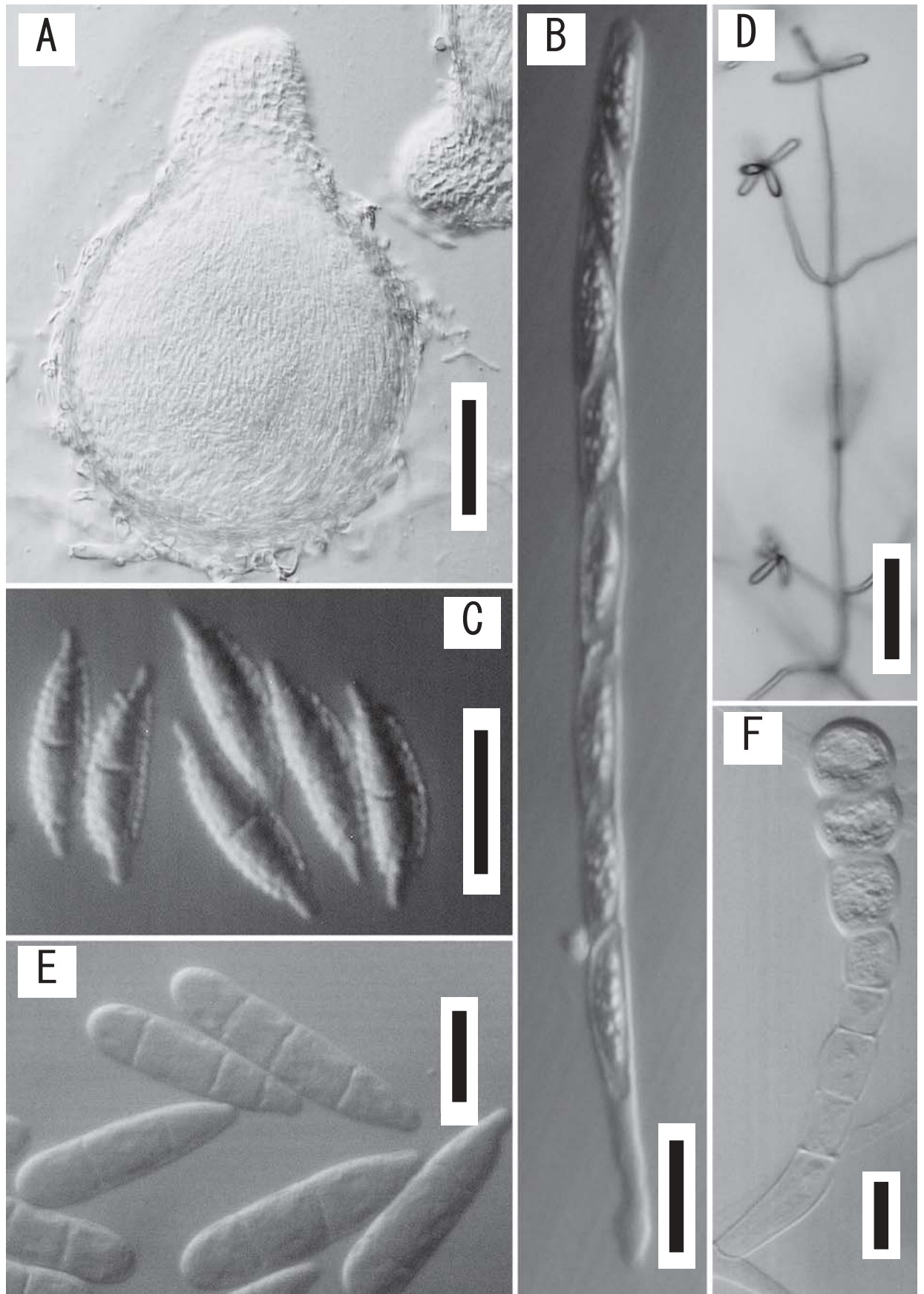


Fig. 2. *Hypomyces pseudocorticiicola*. **A–C** Specimen (KPM-NC0009253); **D–F** culture on MEA (JCM 12654). **A** Perithecium. **B** Ascus. **C** Ascospores. **D** Conidiophore and conidiogenous cells. **E** Conidia. **F** Chlamydozoospores. Bars **A, D** 100 µm; **B, C, E, F** 20 µm

Specimen examined: On the fruiting bodies on an unidentified polypore collected at Lake Hatori, Hatori, Ten'ei, Iwase-gun, Fukushima Pref., Japan, on October 3, 1999, by Toshiyuki Tokiwa (holotype: KPM-NC0009253, culture KS 99124 = JCM 12654 = TAMA 82); on *Daedaleopsis styracina* (Henn. & Shirai) Imazeki collected in Higashi-Yamato Park, Kohan, Higashi-Yamato, Tokyo, Japan, on October 23, 1999, collected by Kiyoshi Iguchi (KPM-NC0009254, culture KS 99165 = JCM 12655 = TAMA 64); anamorph on *Xylobolus spectabilis* (Klotzsch) Boidin collected at Mt. Kobo, Soya, Hadano, Kanagawa Pref., Japan, on September 24, 1999, by Hayato Masuya (KPM-NC0009252, culture KS 99121 = JCM 12656 = TAMA 65); on *Trametes versicolor* (L.: Fr.) Pilát collected in Ikuta-ryokuchi, Masugata, Tama, Kawasaki, Kanagawa Pref., Japan, on June 6, 1999, by Kiyoshi Iguchi (culture: KS 99026 = TAMA 24); on *T. versicolor* collected in Higashi-Yamato Park, Kohan, Higashi-Yamato, Tokyo, Japan, on June 19, 1999, by Kiyoshi Iguchi (culture: KS 99039 = TAMA 25); on *T. versicolor* collected in Sugadaira Montane Research Center, University of Tsukuba, Sugadaira, Osa, Sanada, Chiisagata-gun, Nagano Pref., Japan on June 23, 1999, by Seiji Tokumasu (culture: KS 99042 = TAMA 26).

Among the polyporicolous *Hypomyces*, *H. corticiicola* K. Pöldmaa and *H. polyporinus* showed some affinity to the present species in terms of morphology of ascospores and anamorph. Conidia of *H. corticiicola* are, however, less septate and smaller (Pöldmaa and Samuels 1999). *Hypomyces polyporinus* forms narrower ascospores and fewer branches of conidiogenous cells (Carey and Rogerson 1981; Pöldmaa and Samuels 1999; Rogerson and Samuels 1993). In addition, both *H. corticiicola* and *H. polyporinus* always contain aseptate ascospores (Pöldmaa and Samuels 1999; Rogerson and Samuels 1993), which were not observed in the current species. We therefore proposed a new species. *Hypomyces pseudocorticiicola* was observed on rotten fruiting bodies of polypores in the forests between early summer and autumn. The hymenium of infected fruiting bodies was covered with pale yellow brown subiculum. The specimen KPM-NC 0009252 on *Xylobolus spectabilis* was covered with cottony mycelium forming abundant conidia. The teleomorph in cultures showed no difference from those in nature except for the slightly longer basal part of perithecia.

***Hypomyces laeticolor* Tokiwa & Okuda, sp. nov.**

Figs. 3,4

Subiculum aureum vel brunneo-aurantium; hyphae luteolae, 2.0–4.0(–6.0) μm latae, in KOH colore non mutatae. Perithecia ovata vel late elliptica (145–)175–185(–200) μm alta, (120–)175–185(–210) μm lata, fere superficialia, gregaria, ochracea; papilla conica (55–)75–80(–110) μm alta. Asci cylindrici, (82–)104–106(–112) \times (3.0–)4.0–5.0 μm , octospori, apice paulo incrassati et poro praediti. Ascospores fusiformes, (14.0–)15.5–17.0(–20.0) \times (3.5–)4.5–5.0(–5.5) μm , aequaliter bicellulares, hyalinae, verrucosae, utrinque apiculatae; apiculi 0.5–1.0(–2.0) μm longi. Anamorphosis: *Cladobotryum* sp. Coloniae in agar

maltoso celeriter crescentes, post 5 dies ad 25°C 45–60 mm diametro attingentes, floccosae, griseo-aurantiacae vel brunneo-aurantiacae; reversum aurantiacum; odor nullus vel mucidus. Conidiophora ex hyphis aeries nascentia, septata, compluriens ramosa, (1.5–)2.0–2.5(–6.0) μm crassa. Cellulae conidiogenae acropleurogenae, (3–)4–6(–9)-verticillatae, hyalinae, tenuatim lanceolatae, sursum attenuatae. Conidia solitaria, late ellipsoidea vel ellipsoidea, (9.0–)12.0–16.0(–21.0) \times (3.0–)5.0–6.0(–10.0) μm , (0)1–2(–3)-septata, hyalina. Chlamydosporae orculiformes, hyalinae, 6.0–9.0(13.0) μm latae, breviter catenatae.

Teleomorph in nature: Subiculum vivid yellow (Munsell 5Y8/12) to brownish-orange (Munsell 10YR7/6), covering the hymenial layers of host; hyphae pale yellow (Munsell 5Y9/2), 2.0–4.0(–6.0) μm in width, parenchymatous, septate, thick-walled, KOH(–). Perithecia yellowish-brown (Munsell 10YR6/8), ovoid to broadly ellipsoidal, (145–)175–185(–200) \times (120–)175–185(–210) μm , superficially in group; papilla conical, (55–)75–80(–110) \times (80–)90–110

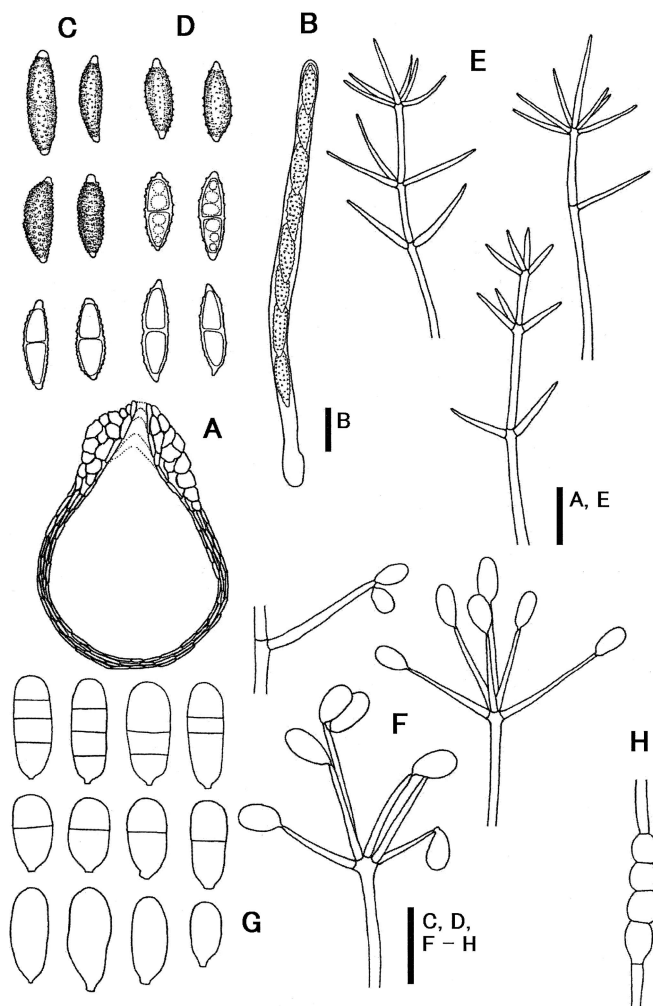


Fig. 3. *Hypomyces laeticolor*. A–C Specimen (KPM-NC0009255); D–H culture on MEA (JCM 10758). A Vertical section of a perithecium. B Ascus. C Ascospores. D Ascospores. E Conidiophores and conidiogenous cells. F Conidiogenous cells and conidia. G Conidia. H Chlamydosporae. Bars A, E 100 μm ; B–D, F–H 20 μm

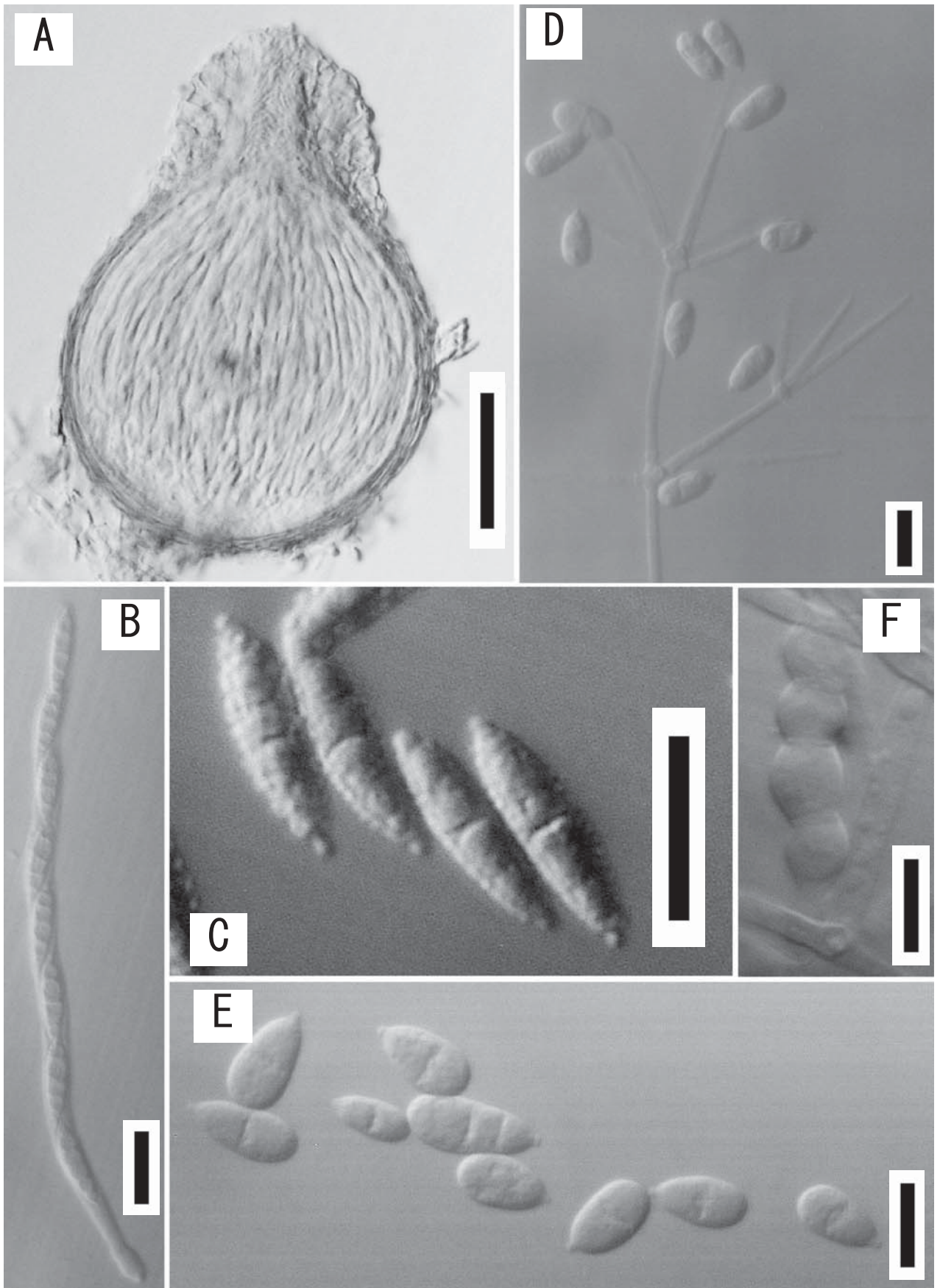


Fig. 4. *Hypomyces laeticolor*. **A–C** Specimen (KPM-NC009255); **D–E** culture on MEA (JCM 10758). **A** Perithecium. **B** Ascus. **C** Ascospores. **D** Conidiophore and conidiogenous cells. **E** Conidia. **F** Chlamydospores. *Bars* **A** 100µm; **B–F** 20µm

(–120) μm . Asci cylindrical, (82–)104–106(–112) \times (4.0–)5.0–6.0(–6.5) μm , 8-spored, forming a basal stalk of (5.0–)10.0–12.0(–22.0) μm , slightly thickened at the apex, which has an ostiole 0.5–3.0 μm wide. Ascospores hyaline, fusiform, equally two celled, (14.0–)15.5–17.0(–20.0) \times (3.5–)4.5–5.0(–5.5) μm , verrucose with minute warts 0.5–1.0 μm in diameter, apiculate at both ends; apiculi small, 0.5–1.0(–2.0) μm in length, slightly rounded.

Characteristics in cultures: Colonies on MEA, OA, or PDA growing rapidly, reach 45–60 mm in diameter after 5 days at 25°C, showing floccose appearance, melon-yellow or grayish-orange (Munsell 10YR8/8–4) to brownish-orange (Munsell 10YR7/4); margins uneven, odorless to fungoid odor, reverse orange (Munsell 10YR7/12), brownish-orange (Munsell 10YR7/6), or brownish-yellow (Munsell 10YR7/10); with well-developed tangled aerial mycelium partly forming dense mycelial mat, on which a number of sclerotia are produced, grayish-yellow (Munsell 10YR8/8), turning out to be perithecia. Hyphae hyaline, (1.5–)4–5.5 μm wide, septate, thick walled. Conidiophores borne from aerial hyphae, semi-macronematous, septate, slightly thick walled, irregularly branched several times, (1.5–)2.0–2.5(–6.0) μm , bearing conidiogenous cells at the apex. Conidiogenous cells borne at the apex or laterally as a well-developed verticil of (3–)4–6(–9) on the conidiophores, hyaline, (14–)22–34(–50) \times (1.0–)2.0–2.5(–3.0) μm , lanceolate, gradually tapering into the narrow apex 0.5–1.0(–1.5) μm in width. Conidia solitary, hyaline, (0–)1–2(–3) septate, broadly ellipsoidal to ellipsoidal, thin walled, smooth, (9.0–)12.0–16.0(–21.0) \times (3.0–)5.0–6.0(–10.0) μm . Chlamydospores borne in a short chain on the side branches of substrate hyphae, hyaline, smooth, barrel shaped, 6.0–9.0(–13.0) μm wide.

Etymology: Bright-colored subiculum.

Habitat: Parasitic on polypores.

Specimen examined: On the fruiting bodies of *BasidiRADulum* sp., collected in Mt. Kobo, Soya, Hadano, Kanagawa Pref., Japan, on October 28, 1999, by Toshiyuki Tokiwa (Holotype: KPM-NC0009255, culture KS 99138 = JCM 10758 = TAMA 66).

The host fruiting bodies are characteristically covered with vivid yellow subiculum on which a number of perithecia are developed. The teleomorph on agar showed no fundamental difference, but the upper surface of perithecia consisted of skeletal hyphae. The present fungus is characterized by small apiculi on the ascospores and well-developed verticillate conidiogenous cells. *Hypomyces albidus* Rehm, *H. sibirinae* Rogerson & Samuels, and *H. sympodiophorus* Rogerson & Samuels showed some resemblance. However, the latter two species have more-rounded ends on ascospores. In addition, *H. sibirinae* forms unequally two-celled ascospores and the ascospores of *H. sympodiophorus* are one- or two celled. *Hypomyces albidus* forms wider ascospores and less developed conidiogenous cells (Rogerson and Samuels 1993; Pöldmaa and Samuels 1999). Pöldmaa and Samuels (1999) reported that colony color is often species specific. The present fungus showed similar color to that in *H. semitranslucens* G.R.W. Arnold. However, the ascospores (19–23 μm in length) of *H.*

semitranslucens are longer (Rogerson and Samuels 1993). The possible assignment to *H. semitranslucens* was also excluded by the lack of strong yeastlike odor (Pöldmaa and Samuels 1999). We therefore proposed a new species for the present fungus.

Hypomyces penicillatus Tokiwa & Okuda, sp. nov.

Figs. 5,6

Subiculum effusum, aureum vel flavum; perithecia obpyriformia vel ellipsoidea, (240–)265–300 μm alta, (260–)265–310 μm lata, semiimmersa, gregaria, flavida vel citrina; papilla conica. Asci cylindrici, (109–)115–117(–125) \times 5.0–5.5(–6.5) μm , octospori, apice paulo incrassati et poro praediti. Ascosporae fusiformes, (13.0–)15.0–17.0(–19.0) \times (3.5–)4.5–5.5(–6.0) μm , unicellulares vel aequaliter bicellulares, hyalinae, verrucosae, utrinque apiculatae; apiculi 1.0–2.0 μm longi. Anamorphosis *Trichothecium* sp. Coloniae in agaro maltoso cereliter crescentes ad 25°C, floccosae, aurantiae, ex hyphis radiatim vel zonatim

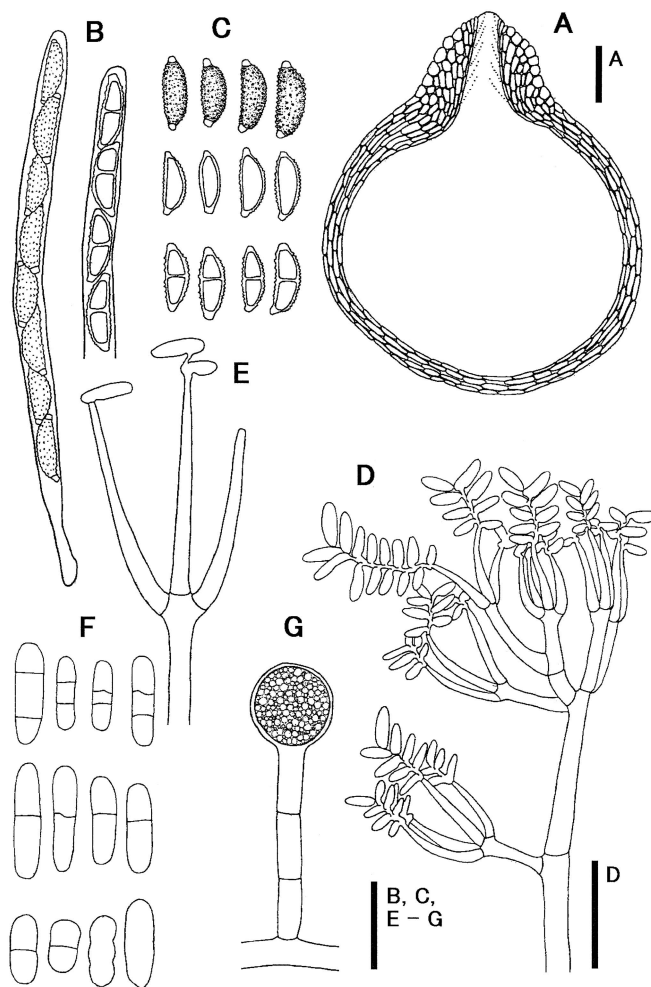


Fig. 5. *Hypomyces penicillatus*. A–C Specimen (KPM-NC001261); D–G culture on MEA (NBRC 100524). A Vertical section of a perithecium. B Asci. C Ascospores. D Conidiophore and conidiogenous cells. E Conidiogenous cells and imbricate conidial chains. F Conidia. G Chlamydospore. Bars A, D 100 μm ; B, C, E–G 20 μm

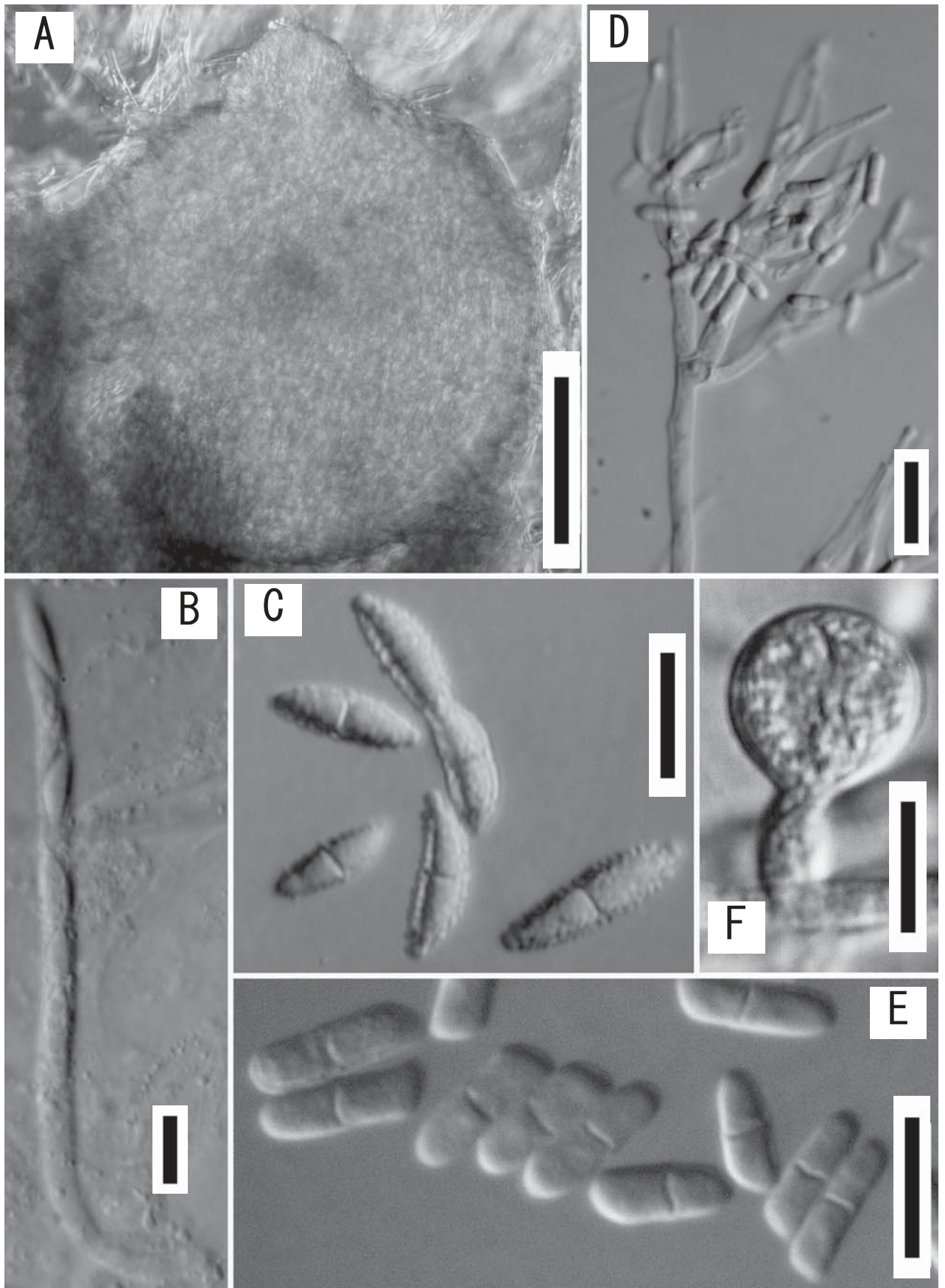


Fig. 6. *Hypomyces penicillatus*. **A–C** Specimen (KPM-NC001261); **D–F** culture on MEA (NBRC 100524). **A** Perithecium. **B** Ascus. **C** Ascospores. **D** Conidiophore and conidiogenous cells. **E** Conidia. **F** Chlamydospore. *Bars* **A** 100µm; **B–F** 20µm

crescentibus compositae, margine dentato; reversum ochraceum vel aurantiacum; odor nullus. Conidiophora 2–4-pro ramosa, irregulariter verticillaria vel penicilliformia. Cellulae conidiogenae acropleurogenae, lanceolatae, sursum attenuatae, (16–)40–51(–100) × (2.5–)3.0–5.0(–6.5) μm. Conidia acrogena, cylindrica vel oblonga, (12.5–)14.5 × 19.0(–22.5) × (3.0–)4.0–5.5(–8.0) μm, 0–1(–2)-septata, hyalina, catenis longiusculis imbricatis adhaerentia. Chlamydosporae subglobosae, hyalinae, laeves, (11.0–)13.0–17.5(–21.0) μm latae.

Teleomorph in nature: Subiculum effuse, vivid yellow to yellow (Munsell 5Y8/12-8), covering entire surface of hymenium; hymenial hyphal structures parenchymatous, thick walled, KOH(–). Perithecia pale yellow to pastel yellow (Munsell 5Y9/2-6), obpyriform to broadly ellipsoidal, (240–)265–300 × (260–)265–310 μm, borne in groups half-immersed in the mycelia; papilla conical, (35–)80–85 × (75–)105–120 μm; with a flat surface apex bearing an ostiole, 35–65(–85) μm in width. Asci cylindrical, (109–)115–117(–125) × 5.0–5.5(–6.5) μm, eight-spored, with a stalk 10.5–12.0(–17.5) μm long, forming a pore at the slightly thick-walled apex. Ascospores hyaline, fusiform, equally two-celled or aseptate, (13.0–)15.0–17.0(–19.0) × (3.5–)4.5–5.5(–6.0) μm, verrucose with warts 0.5 μm in diameter, apiculate but rounded at both ends; apiculi 1.0–2.0 μm long.

Characteristics in culture: Colonies on MEA, OA, or PDA grow rapidly to reach 90 mm in diameter after 7 days at 25°C, floccose, pale yellow, light yellow to vivid yellow, or light orange to brownish-orange (Munsell 5Y9/2, 5Y8/10, 5YR8/6-4), margins dentate, odor none, reverse brownish-yellow, orange, vivid yellow, or melon-yellow (Munsell 10YR6-8/10, 5Y8/14, 10YR8/8), forming a radiate or concentric zonate hyphal network. Conidiophores borne from aerial hyphae, semimacronematous, septate, slightly thick walled, two to four times branched irregularly, (4.0–)5.0–6.5 μm wide, forming conidiogenous cells at the apex. Conidiogenous cells born laterally or as a main branch of conidiophores, in a dense penicilli-form, hyaline, (16–)40–51(–100) × (2.5–)3.0–5.0(–6.5) μm, lanceolate, gradually tapered to the apex, (1.0–)1.5–2.5 μm in width. Conidia retrogressively born in imbricate chains from the apex of conidiogenous cells, hyaline, 0–1(–2)-septate, cylindrical to long ellipsoidal, thin walled, smooth, (12.0–)14.5–19.0(–22.5) × (3.0–)4.0–5.5(–8.0) μm. Chlamydospores produced laterally on the substrate hyphae or terminally at the apex of the branches, hyaline, smooth, subglobose, (11.0–)13.0–17.5(–21.0) μm in width.

Etymology: Named after dense penicillate conidial structures.

Habitat: Parasitic on fruiting bodies of *Stereum ostrea* (Nees: Fr.) Fr.

Specimen examined: On the fruiting bodies on *S. ostrea* collected in Naganuma Park, Naganuma, Hachioji, Tokyo, Japan, on October 12, 2001, by Toshiyuki Tokiwa (Holotype: KPM-NC0012061, culture KS 01051 = NBRC 100524 = TAMA 77) and on November 10, 2001, by T. Tokiwa (KPM-NC0012062, culture KS 01060 = TAMA 78); anamorphs on *S. ostrea* collected at Fudo Waterfall, Ohara,

Haramachi, Fukushima Pref., Japan, on October 5, 2002, collected by T. Tokiwa (KPM-NC0012063, culture KS 02103 = NBRC 100525 = TAMA 75) and at Yoro Valley, Awamata, Ohtaki, Isumi-gun, Chiba, Japan, on July 5, 2003, collected by T. Tokiwa (KPM-NC0012064, culture KS 03039 = NBRC 100526 = TAMA 79).

This species is characterized by the KOH-negative subiculum and *Trichothecium* anamorph. *Hypomyces subiculosus* (Berk. & M.A. Curtis) Höhn., a well-known species found everywhere in Japan, also forms a *Trichothecium*-anamorph, but is readily distinguished by the KOH-positive teleomorph and less complicated branching of conidiophores (Tubaki 1955, 1975; Rogerson and Samuels 1993). Another similar species, *Hypomyces* sp. 169800, that has been reported by Pöldmaa (1999) forms pure white colonies, imbricate chains of *Trichothecium*-like conidia, and KOH(–) subiculum, which is hence considered as an albino strain of *H. subiculosus* by her. Our species was, however, different because of broader rough-walled ascospores, bright color of colonies, well-developed penicillate branching of conidiophores, and chlamydospore formation. Castañeda (1986) has described a similar species to the current one, i.e., *Cladobotryum pinarense* R.F. Castañeda. This anamorphic species is characterized by cream to brown colonies, well-developed penicillate conidial structures, and catenate *Trichothecium*-like conidia. However, *C. pinarense* forms apparently narrower (less than 3.5 μm), 0–1-septate conidia, and emits a characteristic mushroom odor. *Hypomyces penicillatus* was therefore described as a new species.

Acknowledgments We thank Emeritus Prof. Keisuke Tubaki of the University of Tsukuba for his encouragement and fruitful discussion throughout this work. We thank Dr. Ken Katamoto, formerly professor of Yamaguchi University, for his generous help in the preparation of the Latin diagnosis. Thanks are also due to Mr. Kiyoshi Iguchi of Hiraoka Environmental Institute, Dr. Hayato Masuya of Forestry Research Institute, and Prof. Seiji Tokumasu of University of Tsukuba for collecting the specimen. We also thank Drs. Kadri Pöldmaa of University of Tartu, Estonia, and Gary J. Samuels of USDA-ARS, USA, who kindly allowed us to examine their cultures.

References

- Anonymous (1991) Munsell color system. Japan Color Enterprise, Tokyo
- Carey ST, Rogerson CT (1981) Morphology and cytology of *Hypomyces polyporinus* and its *Symptodiophora* anamorph. Bull Torrey Bot Club 108:12–24
- Castañeda Ruiz RF (1986) Fungi Cubense. Inst Invest Fund Agric Trop “Alejandro de Humboldt,” la Habana, Cuba 4:20
- Matsushima T (1975) Icones microfungorum a matsushima lectorum. Published by the author, Kobe, p 32
- Pöldmaa K (1996) A new species of *Hypomyces* and three of *Cladobotryum* from Estonia. Mycotaxon 59:389–405
- Pöldmaa K (1999) The genus *Hypomyces* (Hypocreales, Ascomycota) and allied fungicolous fungi in Estonia. I. Species growing on aphyllorhalean basidiomycetes. Folia Cryptog Estonica 34:15–31
- Pöldmaa K (2003) Three species of *Hypomyces* growing on basidiomata of Stereaceae. Mycologia 95:921–933
- Pöldmaa K, Samuels GJ (1999) Aphyllorhicolous species of *Hypomyces* with KOH-negative perithecia. Mycologia 91:177–199

- Põldmaa K, Samuels GJ, Lodge DJ (1997) Three new polyporiculous species of *Hypomyces* and their *Cladobotryum* anamorphs. *Sydowia* 49:80–93
- Rogerson CT, Samuels GJ (1993) Polyporiculous species of *Hypomyces*. *Mycologia* 85:231–272
- Tokiwa T, Okuda T (2001) Japanese fungicolous ascomycetes, three *Hypomyces* species (in Japanese). *Nippon Kingakukai Kaiho* 42:199–209
- Tokiwa T, Okuda T (2004) Japanese species of *Hypomyces* and their anamorphs. II (in Japanese). *Nippon Kingakukai Kaiho* 45:31–38
- Tubaki K (1955) Studies on the Japanese Hyphomycetes (II). Fungicolous group. *Nagaoa* 5:11–40
- Tubaki K (1975) *Hypomyces* and the conidial states in Japan. *Rep Tottori Mycol Inst* 12:161–169
- Yasuda A (1920) Mycological notes 104. *Bot Mag Tokyo* 34:294–295