

SHORT COMMUNICATION

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## *Lactarius ochrogalactus*, a new species of the genus *Lactarius* (Russulaceae, Russulales) with yellowish-brown latex

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**Abstract** *Lactarius ochrogalactus* Hashiya, invalidly published in 1994, is validated and described in detail here. It is characterized by having yellowish-brown basidiocarps, yellowish-brown latex that stains reddish-brown, lampropalisade pileipellis, lamprotrichoderm stipitipellis, pleuromacrocytidia, and basidiospores that are ornamented with warts connected by fine lines. Because this species shares some characters with *Lactarius* subgen. *Plinthogali* as well as with *Lactarius* subgen. *Lactiflui*, we prefer to wait for molecular data before defining this species to a subgenus or section.

**Key words** *Lactiflui* · Latex · Pileipellis · *Plinthogali* · True macrocytidia

*Lactarius ochrogalactus* Hashiya is an invalidly published name because no Latin description was provided and no type designated when Hashiya described it for the first time (Hashiya 1994; Greuter et al. 2000). The name was given to an easily recognizable species by the yellowish-brown latex that stains the lamellae reddish-brown (Hashiya 1994). Since 1994, more collections have been found in Japan, as well as in China. We prefer to validate the name “ochrogalactus” and give an elaborate description of the taxon here.

The second author made field observation in Japan and examined the collections deposited in TYM. The first and third authors made micromorphological observations. Color codes are from Kornerup and Wanscher (1967) and Rayner (1970). For explanation of spore measurements, see

Yang (2000). Spore measurements in the Latin description are from the holotype only. Herbarium abbreviations used are as follows: HKAS, Cryptogamic Herbarium, Kunming Institute of Botany, Chinese Academy of Sciences, Kunming, China; TMI, Herbarium of Tottori Mycological Institute, Tottori, Japan; TYM, Herbarium of Botanic Gardens of Toyama, Toyama, Japan.

***Lactarius ochrogalactus*** Hashiya, sp. nov. Figs. 1–7  
Pileus 2–8 cm diametro, convexo-depressus, umbonatus, rugosus, subvelutinus, ochraceus. Lamellae subdensae, pallide flavae. Stipes 4–6 × 0.8–1.5 cm, subvelutinus, ochraceus. Latex copiosus, ochraceus, translucidus, rubro-brunnescens, mitis vel leviter amarus. Pleuromacrocytidia sublanceolata. Basidia tetraspora, clavata. Sporae (7.0–)8.5–10.0 × (6.0–)7.0–8.0(–8.5) μm [Q = (1.10–)1.11–1.31 (–1.32), Q = 1.22 ± 0.06], ellipsoideae, subcomplete spinosireticulatae, verrucis uque ad 1 μm altis interdum connexis ornatae. Elementa marginata elongata. Pileipellis bistrata, elementa suprapellis cylindrata, 20–40(–60) × 4.0–6.0 μm, apicem versus obtusa vel attenuata, pariete leviter incrassato, subpellis pseudoparenchymatica.

Holotypus: E. Nagasawa 80-102 (TMI 26082), 19. VII. 1980, Ohe, Funaoka-cho, Yazu, Tottori, Japan.

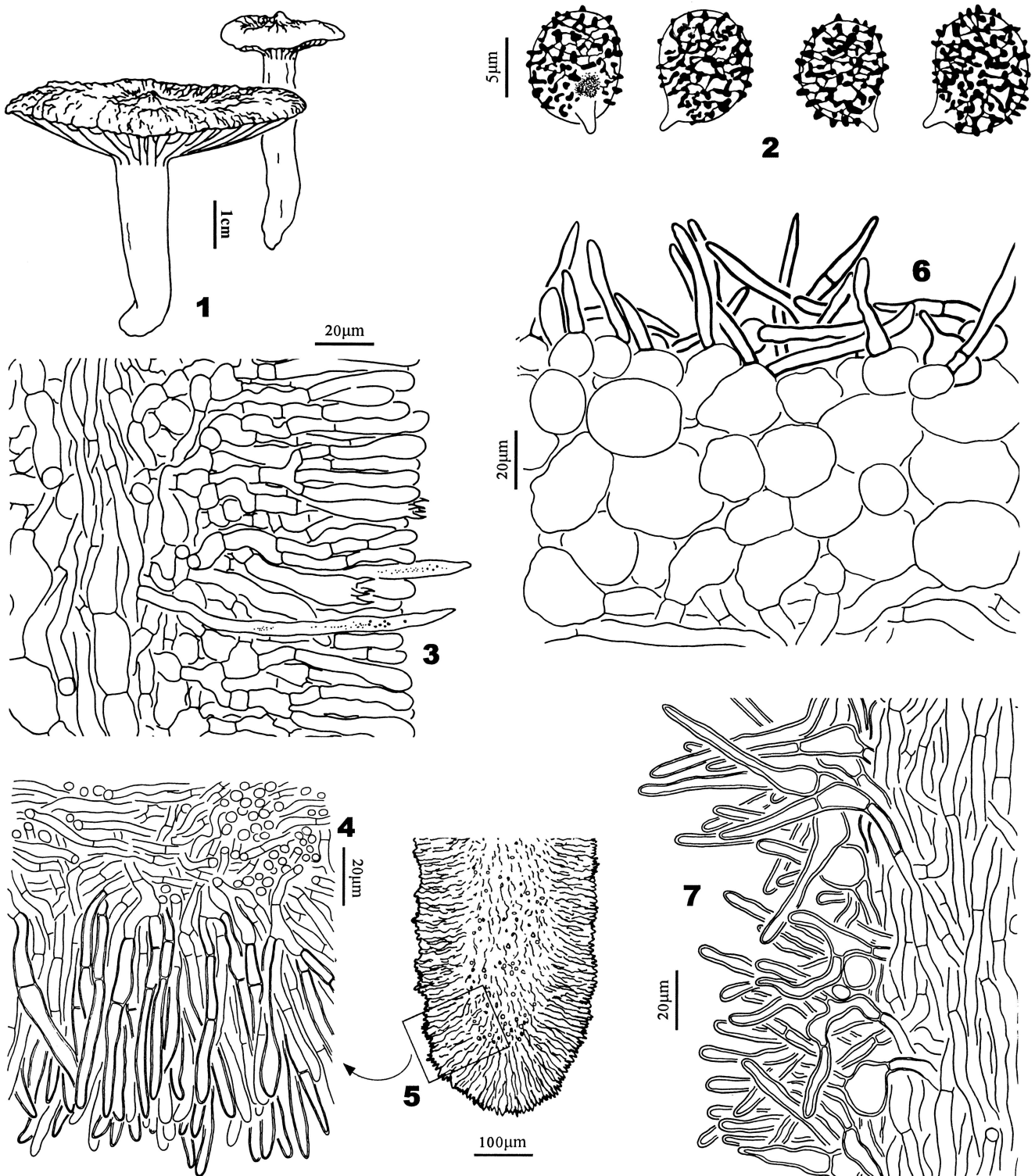
Etymology: Named after its yellowish-brown latex.

Basidiocarps (Fig. 1) medium-sized. Pileus 2–8 cm in diameter, convex then expanded to depressed, often with an acute papilla, radially rugose, dry, velvety, yellowish brown (5E6-8) when young, locally paler, becoming duller and more yellowish in age (6D5-5C5, 4B4-5 near margin when old). Lamellae decurrent, moderately broad, distant to subdistant, with 1–2 (–3) lamellulae, light yellow (4B4-5) when young, pale yellow (3A2-5) with age, with the margin concolorous or more or less tinted brownish-orange (5C4-5), stained grayish-red (9C-D5-6 to 8C5) then light brown (7D5 to 6C-D5), sometimes violet-brown (10F6-4) where injured. Stipe 4–6 × 0.8–1.5 cm, tapering toward the base or more or less cylindrical with a narrower base, subvelvety, sometimes minutely furfuraceous, more or less concolorous with the pileus (5E7-8), usually paler toward the base (5D6-4). Context gradually discoloring “coral” (Rayner 1970)

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**Figs. 1–7.** *Lactarius ochrogalactus* (TMI 26082, holotype). 1 Basidiocarps; 2 basidiospores; 3 hymenium with pleuromacrocystidia; 4, 5 lamellar margin; 6 pileipellis; 7 stipitipellis

when sectioned. Latex yellowish-brown (5D5), light brown (5D6–7), watery, staining lamellae reddish-brown (9D5) after a few minutes, taste none, more or less acrid, or like that of blood or iron. Odor disagreeable. Spore print white.

Basidiospores (Fig. 2)  $(7.0\text{--})8.0\text{--}10.0\text{--}(11.5) \times (6.0\text{--})6.5\text{--}8.0\text{--}(9.0) \mu\text{m}$  ( $Q = (1.08\text{--})1.11\text{--}1.31\text{--}(1.36)$ ,  $Q = 1.20 \pm 0.06$ ) (100/3/3), ellipsoid; ornamentation up to  $1.0 \mu\text{m}$  high, mostly  $0.3\text{--}0.8 \mu\text{m}$  high, composed of pyramidal warts connected by

fine lines, forming an almost complete reticulum; plage none or only weakly centrally amyloid. Basidia 50–65 × 13–15 µm, 4-spored, clavate. Pleuromacrocytidia (Fig. 3) 75–100(–120) × 4.0–6.0 µm, scarce to common, narrowly sublanceolate, apex with sparse granular content, originating deep from the subhymenium or even trama. Pseudocystidia 3.0–5.0 µm in diameter, apex obtuse, not branching. Lamellar margin (Figs. 4, 5) sterile; marginal cells 70–90 × 4.0–5.0(–6.0) µm, very compactly arranged, cylindrical, apex obtuse or tapering, with 1–3 septa, hyaline or brownish, slightly thick-walled (wall 0.3–0.5 µm thick); sterile layer extending 400–500 µm on lamellar sides. Lamellar trama mixed, distinct rosettes of sphaerocytes present. Pileipellis (Fig. 6) a lampropalisade; terminal cells of suprapellis 20–40(–60) × 4.0–6.0 µm, cylindrical, slightly thick-walled; wall up to 0.5 µm thick, with paler or darker brownish tinge; subpellis pseudoparenchymatous, composed of more or less globose elements, (15–)20–40 µm in diameter. Stipitipellis (Fig. 7) a lamprotrichoderm with some hyphae of subpellis inflated to subglobose; terminal cells 20–60 × 5.0–6.0 µm, thick-walled with wall 1.0–2.0 µm thick, apex obtuse.

Specimens examined: Japan: Ohe, Funaoka-cho, Yazu, Tottori, in *Quercus serrata* Thunb.-*Castanea crenata* Sieb. & Zucc. forest, July 19, 1980, E. Nagasawa 80-102 (TMI 26082, holotype); Hiruzen experimental forest of Tottori University, Kawakami-son, Maniwa, Okayama, in *Q. serrata* forest, September 13, 1993, Nagasawa s. n. (TMI 26088); Ryuou-Kyou, Huziwara-cho, Shioya, Tochigi, under *Q. serrata*, July 22, 2000, Y. Shibata (M. Hashiya 2590 in TYM); Yamanomura Kamioka-cho, Yoshiki, Gifu, August 26, 2001, M. Hashiya 2734 (TYM); Touzai-Hantou, Arimine, Naka-Niikawa, Toyama, under *Fagus crenata* Bl. and *Q. crispula* Bl., September 29, 2001, K. Shioi (M. Hashiya 2812 in TYM); Miyagawa-mura, Yoshiki, Gifu, July 23, 2002, H. Ito (M. Hashiya 3129 in TYM); Tashiro-Tai, Aomori, under *F. crenata*, August 30, 2002, M. Hashiya 3175 (TYM); Tuta, Towadako-cho, Kamikita, Aomori, under *F. crenata*, August 31–September 1, 2002, M. Hashiya 3188, 3179 & 3197 (TYM); Natumaya, Kiyomi-mura, Oono, Gifu, under *F. crenata* and *Q. crispula*, September 29, 2003, M. Hashiya 3890 (TYM); Touzai-Hantou, Arimine, Naka-Niikawa, Toyama, under *F. crenata* and *Q. crispula*, August 6, 2005, M. Hashiya 4995 (TYM). China: Huanglianhe, Xima, Yingjiang, Yunnan, July 17, 2003, Zhu L. Yang 3726 (HKAS 42911).

Habitat: Terricolous, in fagaceous (*C. crenata*, *F. crenata*, *Lithocarpus* sp., *Q. crispula* and *Q. serrata*) forests.

Notes: This species cannot be confused with other taxa in the genus *Lactarius* Pers. because of the combination of the following characters: yellowish-brown basidiocarps, yellowish-brown latex that stains the lamellae reddish-brown, lampropalisade as a pileipellis structure, lamprotrichoderm as a stipitipellis structure, presence of true macrocytidia, long marginal cells, and spores ornamented with warts connected by fine lines. The true pleuroma-

crocytidia, although as narrow as the pseudocystidia, can be distinguished from the latter by the more or less granular internal content and the basal septum.

Its dull-colored basidiocarps and the staining of the latex could argue for its position in *Lactarius* subgen. *Plinthogali* (Burl.) Hesler & A.H. Sm. (Hesler and Smith 1979; Verbeken 2000). However, the more or less thick-walled elements in the pileipellis and stipitipellis suggest its similarity to *Lactarius* subgen. *Lactifluus* (Burl.) Hesler & A.H. Sm. (Verbeken 1998). Further molecular work will be helpful to determine its phylogenetic position.

In *Lactarius* subgen. *Plinthogali*, only *L. petersenii* Hesler & A.H. Sm. exudes brownish latex. However, its lamellae are closer, the ornamentation of spores is much less, and the cheilocystidia are much shorter than our taxon (Hesler and Smith 1979). The ornamentation of spores in *L. ochrogalactus* recalls that of *L. lignyotellus* A.H. Sm. & Hesler, a species with much darker basidiocarps, marginate lamellae, and milky-white latex that never discolors or stains (Smith and Hesler 1962). *Lactarius minimus* var. *macrosporus* Z.S. Bi & G.Y. Zheng, originally described from southern China, also has yellowish-brown latex, but differs in the much smaller basidiocarps that discolor dull red when bruised (Bi et al. 1985).

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