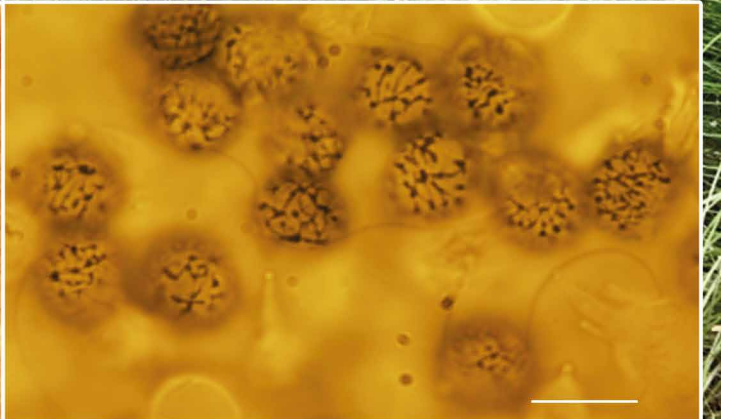
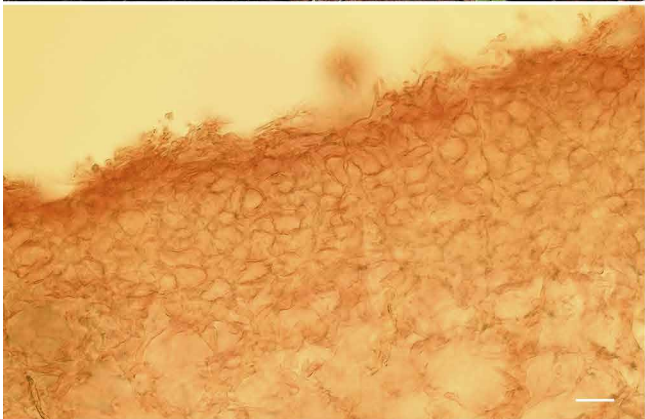


Lactifluus austropiperatus



Fungal Planet 1087 – 29 June 2020

***Lactifluus austropiperatus* T. Lebel & L. Tegart, sp. nov.**

Etymology. Named for its similarity to *Lactifluus piperatus* from the Northern Hemisphere and its distribution in Australia.

Classification — *Russulaceae*, *Agaricales*, *Agaricomycetes*.

Basidiomata robust, lactarioid. *Pileus* 30–50 mm diam, convex with decurved margin, planoconvex with depressed centre when mature; pileipellis dry, glabrous, azonate, whitish variously tinged with yellowish or hints of pale orange when younger, to pale-biscuit-buff overall in older specimens. *Lamellae* sub-decurrent, close (c. 5–7 per cm) with some forking closer to margin, and 2–3 rows lamellulae, very pale orange, bruising a little darker with handling. *Stipe* 32–65 × 8–16 mm, cylindrical, whitish tinged with yellowish or hints of pale orange; context white, unchanging, taste hot and peppery. *Latex* copious, white, unchanging or barely yellowing slightly after 10–15 min, very hot and peppery. Spore print white. *Spores* (7.5–)8.5–9.5 × 6.8–8.4 μm (n = 40, 8.11 ± 0.55 × 7.28 ± 0.61), Q = 1.07–1.15 ± 0.03, barely globose to subglobose, asymmetric, hyaline; ornamentation amyloid, up to 0.4 μm high, composed of irregular warts that join together to variable degree in short thin fine lines; plage inamyloid. *Basidia* 32–45 × 6–11 μm, cylindrical to subclavate, 4-spored; sterigmata short, robust. *Pleuromacrocystidia* 35–60 × 4–7 μm, abundant, narrowly cylindrical to fusiform, with tapering apex. *Pleuropseudocystidia* similar size and shape to pleuromacrocystidia, moderately abundant, sometimes with irregular mucronate apices. *Cheilomacrocystidia* (29–)40–65(–75) × 4–6.5(–8) μm, cylindrical to filiform with acute or capitate apices, with crystalline contents, scattered, more obvious in younger specimens. *Hymenophoral trama* up to 70 μm wide, composed of interwoven hyaline hyphae of 3–6 μm diam and abundant sinuous lactifers up to 10 μm thick, sphaerocytes rare; subhymenium layer up to 25 μm thick, parenchymatous, cells 6–11 μm diam. *Pileipellis* a hyphoepithelium, 2-layered: subpellis up to 155 μm thick, composed of globose to subglobose cells 8–21 μm diam; suprapellis 31–50 μm thick, composed of mostly repent thin-walled hyphae, frequently septate, 2–4(–5) μm broad; context broad, composed of heteromerous tissue, sphaerocytes up to 35 μm diam interwoven with hyaline hyphae 3–7 μm diam, and scattered to abundant sinuous laticiferous hyphae of 5–12 μm diam.

Habit, Habitat & Distribution — In savanna eucalypt woodland with *Eucalyptus pilularis* or *E. delegatensis*, and *E. cypello-carpa* near creek lines with *Syzygium*, *Allocasuarina*, *Acacia* spp., with tall grass understorey, rarely in mixed *Nothofagus moorei* forest leaf litter; solitary but common.

Colour illustrations. Savanna eucalypt woodland dominated by *Eucalyptus pilularis* and *Allocasuarina littoralis* (photo F. Guard). Basidiomata; section through hyphoepithelium pileipellis; and spores in Melzer's reagent. Scale bars: 10 mm; 20 μm; 10 μm.

Typus. AUSTRALIA, Queensland, Yungaburra Rifle Range, 3 Apr. 1989, N.L. Bougher E4074, found in savanna woodland dominated by *Eucalyptus pilularis* and *Allocasuarina littoralis* (holotype PERTH 07550324; ITS and LSU sequences GenBank MN614115 and MN614111, MycoBank MB832709).

Additional material examined. AUSTRALIA, Queensland, Tullawallal, 3 Apr. 2002, A.M. Young LNP551 & N. Fechner AQ 0808481 (ITS and LSU sequences GenBank MN614118 and MN614113); Northern Territory, Tiwi Islands, Melville Island, Conder Point, 27 Apr. 1989, J.A. Curnow 3148 MEL 2202701 (ITS sequence GenBank MN614117); New South Wales, Joys Creek Track near summit of Mt Jersey, 27 Mar. 2002, Thiele 2074, MEL 2150778 (ITS and LSU sequences GenBank MN614116 and MN614112).

Notes — *Lactifluus austropiperatus* morphologically closely resembles *Lf. subpiperatus*, described from Japan (Hongo 1964); unfortunately, no sequence data are currently available for comparison. *Lactifluus dwaliensis*, *Lf. allardii*, *Lf. glaucescens*, and *Lf. subpiperatus* grow respectively in association with species of oak in temperate deciduous forests in India, hardwood or pine-oak forests in central to southern USA, mixed deciduous forests in Europe, or deciduous oak forest in Japan (Das et al. 2003, Verbeke et al. 2012). *Lactifluus dwaliensis* is a rare all-white species with quite a long stipe, and context and tissue that slowly stains light greenish yellow, while *Lf. allardii* is stockier, with pinkish brown colours and flesh that stains purplish pinkish then green, and white copious latex that slowly turns greenish then brownish (Das et al. 2003, De Crop et al. 2014). *Lactifluus glaucescens* is an elegant, all-white species with densely crowded lamellae and latex that turns slowly olive to pastel green. All five species have smallish spores with low ornamentation under 0.5 μm high, as isolated warts with scattered connecting lines, grading into a partial reticulum. *Lactifluus subpiperatus* is morphologically most similar to *Lf. austropiperatus*, also having white then patchily pale ochraceous, somewhat stocky basidiomata, forked lamellae, and small subspherical spores (Hongo 1964). However, *Lf. austropiperatus* has sporocarps with more yellowish to pale orange tinges, flesh and latex that does not change colour or only very slowly and slightly, with no green tones, and pleuromacrocystidia are present (De Crop et al. 2014). *Lactifluus austropiperatus* grows in association with subtropical forest of *Eucalyptus*, and more rarely *Nothofagus*, in northern NSW and southern QLD, Australia.

In our analysis *Lf. austropiperatus* is in a strongly supported clade with a specimen from Thailand (GenBank KF220110, *H.T. Le* 376), however, at this time we maintain the Australian material as distinct until further collections from Thailand can be examined and sequenced. Preliminary morphological examination shows the spores of *H.T. Le* 376 to be slightly smaller, and the ornamentation to be slightly finer than the Australian material. *Lactifluus austropiperatus* is sister to *L. dwaliensis*, a specimen from Honduras (LMUNAH0073; no plant associate listed), and an environmental sample from Florida, USA associated with *Pinus clausa*.

Supplementary material

FP1087 Bayesian (MrBayes v. 3.2.6) 50 % majority-rule consensus tree of the ITS-nrDNA for a selection of *Lactifluus* species. Thickened lines indicate PP support > 0.95.