

A new species of *Leccinum* (Basidiomycota, Boletales) from Belize

BEATRIZ ORTIZ-SANTANA¹ AND ROY E. HALLING²

¹Center for Forest Mycology Research, US-Forest Service, Northern Research Station, One Gifford Pinchot Drive, Madison, WI 53726-2398, USA; e-mail: bortizsantana@fs.fed.us

²Institute of Systematic Botany, The New York Botanical Garden, Bronx, NY 10458-5126, USA; e-mail: rhalling@nybg.org

Abstract. *Leccinum viscosum* is described, illustrated, and compared with similar taxa. Morphological characters indicate that this taxon represents a new species.

Key Words: Boletaceae, Central America, ectomycorrhizal fungi, taxonomy.

The genus *Leccinum* Gray comprises approximately 150 species described worldwide, predominantly from the northern temperate regions (Smith et al., 1966, 1967, 1968; Smith & Thiers, 1971; Lannoy & Estades, 1995; den Bakker & Noordeloos, 2005). In the Neotropics, eight *Leccinum* species have been reported from Costa Rica, three from Colombia and three from Belize (Halling, 1989, 1999; Franco-M. et al., 2000; Halling & Mueller, 2003, 2005; Ortiz-Santana, et al., 2007). In a continuation of inventories for neotropical macrofungi, a new species of *Leccinum* is described from Belize occurring in mixed forests of oak and pine. Based on the data at hand, the new species would belong in subsect. *Pseudoscabra* (Lannoy & Estades, 1995).

Color designations given as page, column, row (e.g., 5B6) are from Kornerup & Wanscher (1978). All microscopic structures were observed with an Olympus BHS compound microscope equipped with Nomarski differential interference contrast (DIC) optics, and measured from dried material revived in 3% KOH. For measurements of basidiospores, n = number measured, x = mean length \times mean width, Q = mean length/width ratio.

Leccinum viscosum Halling & B. Ortiz, **sp. nov.** Type: Belize. Cayo: Mountain Pine Ridge, entrance road to Five Sisters Lodge, 335 m, 6 Oct 2003, Halling 8528 (holotype: NY; isotypes: BRH, CFMR). (Figs. 1, 2)

Differt inter species alias *Leccini* pileo viscoso rugoso reticulato pallide brunneo, margine non appendiculato, hyphis pileipellis hymeniformibus in matricem gelatinosam inclusis, contextu e roseo cyaneo mutabili, basibus stipitum ubi contusis magis aurantiorosis et cyaneoviridibus tingentibus.

Pileus 20–45 mm broad, convex to plano-convex, tacky to subviscid, subrugulose to rugulose at first, becoming reticulate-pitted, grayish orange to apricot yellow (5B6–5B4), then cinnamon brown to mustard brown (6E6, 5E6), lacking a sterile margin. *Flesh* white, staining pink then dark fuscous in pileus, with mild odor and taste. *Tubes* adnexed, yellowish white when young, becoming grayish orange (5B3) and staining pale cinnamon brown; *pores* concolorous, staining cinnamon brown. *Stipe* 40–110 mm long, 5–10 mm broad, curved, \pm equal to subclavate, dry, white, scabrous, scabers white at first, becoming pale tan to pale caramel color, sometimes with a scattered pale pink background above, staining fuscous with handling, white at base, soon changing to pale blue green to greenish blue to deep blue at the base, and often slowly developing scattered orange pink or coral pink stains; interior white, changing to pinkish at apex, bluish green in the base. *Basidiospores* 12.6–17.5 \times 4.9–6.3 μ m, ($n=20$, $x=15.4 \times 5.6 \mu$ m, $Q=2.75$), smooth, fusoid to subfusoid, melleous in KOH, inamyloid. *Basidia* 28–35 \times 10–13 μ m, clavate, hyaline, 4-sterigmate. *Hymenial cystidia* 34–52 \times 6–11 μ m, more abundant at edge of tubes, narrowly subfusoid



FIG. 1. Basidiomata of *Leccinum viscosum* (Halling 8528).

to subfusoid or subcylindric, hyaline, inamyloid, smooth and thin-walled. *Tube trama* boletoid, hyaline, with lateral strata elements 3.5–10.5 μm broad, subgelatinous with age. *Pileipellis* hyphae hymeniform and forming a loose palisade (several cells deep), embedded in a gelatinous matrix, hyaline in KOH, inamyloid, but with coagulated melleous content in Melzer's; elements 14–30 \times 6–14 μm , subelongate to subclavate or short fusoid to subsodiametric, smooth, thin-walled. *Pileus trama* interwoven, hyaline, inamyloid, with

elements 3.5–10.5 μm broad, smooth, thin-walled, with occasional oleiferous elements intermixed. *Caulocystidia* 18–57 \times 8–24 μm , subfusoid to subclavate or clavate-mucronate, hyaline or rarely with a pale melleous content, smooth, thin-walled. *Clamp connections* absent.

Distribution and Ecology.—Gregarious, on sandy soil near *Quercus peduncularis* Née and *Pinus caribaea* Morelet. At present, known only from the Mountain Pine Ridge Reserve of western Belize.

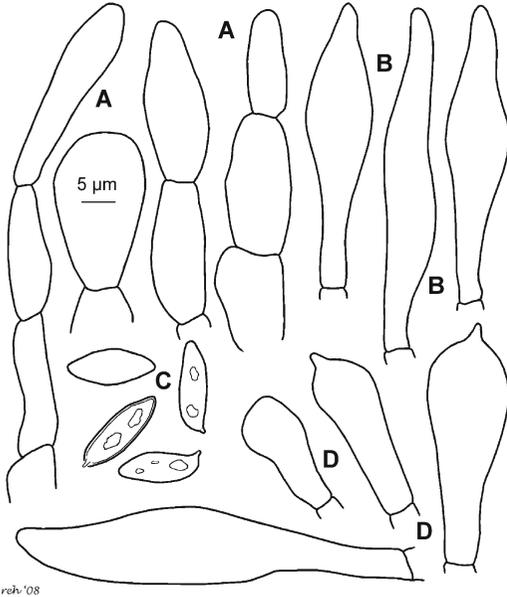


FIG. 2. Microscopic features of *Leccinum viscosum*. A. Elements of the pileipellis (Halling 8506). B. Hymenial cystidia (Halling 8506). C. Basidiospores (Halling 8528). D. Caulocystidia (Halling 8528).

Etymology.—*viscosum*, viscid: pertaining to the viscid pileus.

Additional specimens examined. BELIZE. Cayo District, Mountain Pine Ridge: entrance road to Five Sisters Lodge, 17°2'14"N, 88°58'42"W, 335 m, 2 Oct 2003, Halling 8506 (BRH, CFMR, NY); Macal River, near Guacamayo Bridge, 16°52'8"N, 89°2'29"W, 427 m, 4 Oct 2003, Halling 8519 (BRH, CFMR, NY).

The hymeniform nature of the pileipellis and some of the oxidation reactions recall *Leccinum talamancae* Halling, Gómez & Lannoy (Halling, 1999) from Costa Rica, but the latter taxon has a dry pileus that often becomes areolate and is darkly pigmented, and never develops the coral pink stains on the stipe base exterior. Also, the stipe scabers are much darker in *L. talamancae*. While *L. rugosiceps* (Peck) Singer has a similar pileus and scaber pigmentation, similar oxidation reactions in the pileus flesh and the flesh of the stipe apex, that taxon does not have any stains at the base of the stipe and the pileus is dry, not viscid (see Halling & Mueller, 2003, 2005). *Leccinum violaceotinctum* B. Ortiz & T.J. Baroni, a sympatric taxon recently described from Belize, also has a viscid

pileus and some similar oxidation reactions as *L. viscosum*. However, *L. violaceotinctum* has a smooth, even pileus surface (not rugulose or reticulate-pitted and composed of cylindrical hyphae) that develops turquoise tints (not so in *L. viscosum*) and does not produce the coral pink stains on the stipe.

Acknowledgments

The collection of specimens was supported by a grant from the National Science Foundation, Biodiversity Surveys and Inventories Program to the Research Foundation of the State University of New York, College at Cortland (DEB-0103621), in collaboration with the USDA-Forest Service. The junior author is grateful for funding from the National Science Foundation in grants DEB-9972018 and DEB-0414665.

Literature Cited

- den Bakker, H. C. & M. E. Noordeloos. 2005. A revision of European species of *Leccinum* Gray and notes on extralimital species. *Persoonia* 18: 511–587.
- Franco-M., A. E., R. Aldana-G. & R. E. Halling. 2000. Setas de Colombia (Agaricales, Boletales y otros hongos). Colciencias, Universidad de Antioquia, Medellín.
- Halling, R. E. 1989. A synopsis of Colombian boletes. *Mycotaxon* 34: 93–113.
- . 1999. New *Leccinum*s from Costa Rica. *Kew Bulletin* 54: 747–753.
- Halling, R. E. & G. M. Mueller. 2003. *Leccinum* (Boletaceae) in Costa Rica. *Mycologia* 95: 488–499.
- & ———. 2005. Common mushrooms of the Talamanca Mountains, Costa Rica. New York Botanical Garden Press, Bronx.
- Kornerup, A. & J. H. Wanscher. 1978. *Methuen handbook of colour*. 3rd ed., reprinted. Eyre Methuen Ltd., London.
- Lannoy, G. & A. Estades. 1995. Monographie des *Leccinum* d'Europe. Federation Mycologique Dauphine-Savoie, La Roche-sur-Foron.
- Ortiz-Santana, B., J. D. Lodge, T. J. Baroni & E. E. Both. 2007. Boletes from Belize and the Dominican Republic. *Fungal Diversity* 27: 247–416.
- Smith, A. H. & H. D. Thiers. 1971. The boletes of Michigan. University of Michigan Press, Ann Arbor.
- , ——— & R. Watling. 1966. A preliminary account of the North American species of *Leccinum*, Section *Leccinum*. *Michigan Botanist* 5: 131–154.
- , ——— & ———. 1967. A preliminary account of the North American species of *Leccinum*, Section *Luteoscabra* and *Scabra*. *Michigan Botanist* 6: 107–154.
- , ——— & ———. 1968. Notes on species of *Leccinum*. I. Additions to Section *Leccinum*. *Lloydia* 31: 252–267.