



First record of *Leucoagaricus lilaceus* (Agaricales: Agaricomycetes) in Mexico

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Abstract

Leucoagaricus lilaceus is recorded for the first time in Mexico. This species is characterized by the purplish pileus, whitish to pinkish gills and a wide bulbous base. The next record represents the northernmost distribution of this species so far in America. Microscopic and macroscopic features are described and illustrated.

Key words – Lepiotoid Fungi – Macrofungi – Quintana Roo – Tamaulipas – Yucatán Peninsula

Introduction

The genus *Leucoagaricus* was proposed by Locquin as a sub genus in *Leucocoprinus*, although Singer (1986) considered *Leucoagaricus* as an independent taxon. Most of *Leucoagaricus* species have been described from temperate forest in Europe and North America and the knowledge about the tropical species is still scarce (Liang et al. 2010). Despite the high diversity of species in the *Leucoagaricus/Leucocoprinus* clade, most of the works are focused in ecological relationships instead of taxonomy (Justo et al. 2015). This genus is characterized by the medium to large basidiomata of lepiotoid habit, ranging from fleshy and robust to fragile and thin, free gills never turning blackish when aged and bulbous base. Microscopically the genus shows ellipsoid spores with metachromatic endosporium and germinal pore, with smooth to ornamented spore wall (Vellinga & Davis 2006).

Leucoagaricus lilaceus Singer is a noteworthy species due the purplish lilac pileus, the pinkish gills, the context bruising orange when cut and the bulbous base. *Leucoagaricus lilaceus* was first described from Argentina (Singer & Digilio 1951) and is known from Brazil (Sobestianski 2005, Rother & da Silveira 2009, Ferreira & Cortez 2012) and Paraguay (Flecha-Rivas et al. 2013). During mycological explorations in the Mexican states of Quintana Roo and Tamaulipas, several basidiomata of this species were collected. Due the purplish pileus, the pinkish gills and the bulbous base they were easily determined as *L. lilaceus*, which represents the first record of this species in Mexico, and also the northernmost distribution in America.

Materials & Methods

The basidiomata were collected in the Mexican states of Quintana Roo and Tamaulipas. The collecting sites in Tamaulipas were dominated by lowland forest with *Casimiroa pringlei* (S. Watson) Engl., *Ebenopsis ebano* (Berland.) Barneby & J. W. Grimes, *Havardia pallens* (Benth.) Britton & Rose, *Ocotea tampicensis* (Meisn.) Hemsl., *Platanus rzedowskii* Nixon & Poole, *Randia obcordata* S. Watson, *Sabal mexicana* Mart., *Sideroxylon lanuginosum* Michx., *Sideroxylon persimile* (Hemsl.) T. D. Penn., *Ungnadia speciosa* Endl., and *Zanthoxylum fagara* (L.) Sarg. (García-Morales et al. 2014). In Quintana Roo the sites were dominated by disturbed evergreen rain forest with *Swietenia macrophylla* King, *Brosimum alicastrum* Sw., *Cecropia peltata* L., *Leucaena leucocephala* (Lam.) de Wit. ssp. *leucocephala*, *Bursera simaruba* (L.) Sarg., *Lysiloma latisiliquum* (L.) Benth., and *Metopium brownei* (Jacq.) Urb. (Valdéz & Islebe 2011) and urban gardens. Collecting and sampling macrofungi methods by Lodge et al. (2004) were used. Hand cuts sections were made in dried specimens mounted in KOH 5%, Cresyl Blue and Meltzer reagent for microscopic description. The Hand Book of Color (Kornerup & Wanscher 1978) was used for the color terminology. All the specimens were herborized and deposited at the Mycological Herbarium “José Castillo Tovar” (ITCV) of Instituto Tecnológico de Ciudad Victoria, Mexico.

Results

Eight collections of *L. lilaceus* were studied and they represent the northernmost distribution of *L. lilaceus* so far in America, considering that this species was only known from South America. A taxonomical description, discussion photographs and drawings are provided.

Leucoagaricus lilaceus Singer Lilloa 25: 274 (1952)

Figs 1–2

Pileus 65–75 mm, convex with flattened disc in young states, applanate to slightly umbonate when mature, rimose to areolate, lilac colour (13F4–F6), darker at the disc (13F3–14F3), with cream-pinkish, grey pinkish to brown pinkish background (10C3–10D3), texture dry, margin entire to appendiculate. Context 4–7 mm thick, white, bruising orange to gray when cut, odour and smell sweet. Lamellae free, white to whitish yellow (3AZ–3BZ), becoming pale brown, 5–8 wide, with lamellulae reaching 10 mm long, moderately crowded, soft to fragile, margin smooth, concolorous. Stipe 78–90 × 6–7 mm, cylindrical, pinkish to whitish, brown to lilac at the base, with grey tones when aged, fibrillose to longitudinally striated, with abundant white mycelium rhizomorphs at the base, Ring present, with, with purplish margin. Base bulbous, over 2.5 mm diameter, white or sometimes with lilac tones.

Basidiopores 5.0–7.5 × 3.5–5.0 µm, (Q=1.46, L=5.85, W=3.99, N=50), sub-globose to ellipsoid, hyaline to light green in KOH, pseudoamyloid, sometimes with conspicuous hilar appendage, thick-walled, over 1 µm, smooth, reddish in Cresyl Blue. Basidia 19.0–17.0 × 8.0–13.0 µm, clavate, hyaline to gutulate, four-spored, thin-walled. Pleurocystidia absent. Cheilocystidia 28.0–38.0 × 10.0–13.5 µm, clavate, slightly ventricose or mamelate, hyaline, thin-walled. Hymenophoral trama slightly irregular, composed by loosely interwoven hyphae, 4.5–10.0 µm diameter, tubulose, hyaline, thin-walled, without clamp connections. Pileipellis over 130 µm composed by loosely interwoven tubulose hyphae, with terminal cells in palisade, cylindrical to ventricose, 28.0–50.0 × 6.5–8.0 µm, greyish in KOH, pseudoamyloid, sometimes gutulated, thin-walled.

Known distribution – Argentina, Paraguay and Brazil (Singer & Digilio 1951, Sobestianski 2005, Rother & da Silveira 2009, Ferreira & Cortez 2012, Flecha-Rivas et al. 2013).

Material examined – Mexico, Quintana Roo: Othón P. Blanco municipality, Chetumal, gardens of *El Colegio de la Frontera Sur (ECOSUR)*, 12 July 2015, de la Fuente 56. Urban gardens, 27 October 2015, de la Fuente 162. *Oxtanká* archeological zone, 24 October 2017, Arana, Canul and de la Fuente 355. Tamaulipas: Güémez municipality, *La Esperanza*, 9 August 2005, J. García 14750. Victoria municipality, Ciudad Victoria, urban garden, 9 September 2001, J. García 13467. *Cañón del Novillo*, 16 September 1994, J. García 8965-b. Same locality, 30 October 2016, J. García 21205 and 12 October 2017, J. García 21711 (All in ITCV).

Notes – This is a noteworthy species easily recognized in field due the lilac to purplish pileus. The morphological characters from the Mexican material match well with those quoted by Singer & Digilio (1951), Rother & da Silveira (2009), Ferreira & Cortez (2012), Flecha-Rivas et al. (2013). This is a species belonging in the *Piloseli* section due the lamellae colour and the orange reaction when cut (Singer 1986, Rother & da Silveira 2009, Vellinga et al. 2010). *Lepiota roseolivida* Murrill is a similar species in the purplish shades of the pileus, but it is much smaller and with yellowish stipe. *Lepiota decorata* Zeller is another similar species, but its cystidia have different shape and it is associated to temperate forest with *Pseudotsuga*, *Acer*, *Thuja* and *Alnus*. Both *L. roseolivida* and *L. decorata* fit within *Leucoagaricus*, but they are still considered within *Lepiota* hoping for further taxonomic and phylogenetic studies (Vellinga 2006). *Leucoagaricus subpurpleolilacinus* Z.W. Ge & Zhu L. Yang also shows purplish tints in the pileus, but it has larger basidiospores (reaching 11 μm) and the context does not change when cut (Ge et al. 2015). *Leucoagaricus lilaceus* is found growing scattered in urban gardens, along paths and seems to prefer disturbed vegetation (Rother & da Silveira 2009, Flecha-Rivas et al. 2013).



Fig. 1 – *Leucoagaricus lilaceus* (J García 21271-ITCV). Young and mature basidiomata. Scale bar: 20 mm.

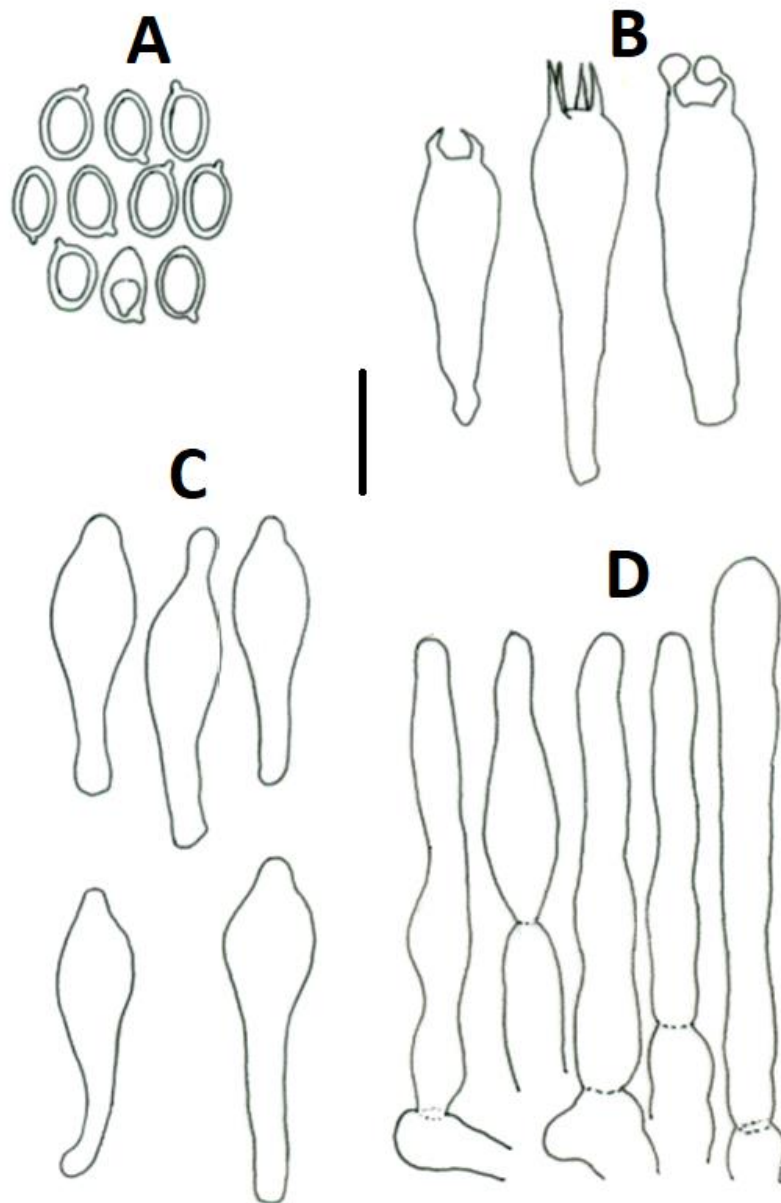


Fig. 2 – *Leucoagaricus lilaceus* (J García 21205-ITCV). Microscopical features. A Basidiospores. B Basidia. C Cheilocystidia. D Elements of Pileipellis. Scale bar: 10 μ m

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