



A new species of *Entolomataceae* with cuboidal basidiospores from the São Paulo Metropolitan Region, Brazil

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Karstedt F, Capelari M 2015 – A new species of *Entolomataceae* with cuboidal basidiospores from São Paulo Metropolitan Region, Brazil. *Mycosphere* 6(1), 69–73, Doi 10.5943/mycosphere/6/1/8

Abstract

A new species of *Entolomataceae* with cuboidal basidiospores, from Reserva Biológica de Paranapiacaba, is described, illustrated and discussed.

Key words – *Entoloma* – taxonomy

Introduction

Most *Entolomataceae* (*Entoloma* s.l.) species are characterized by their peculiar shaped basidiospores that are cuboidal to multiangular, iso- to heterodiametric, and have four to nine angles in profile.

The cuboidal basidiospores have six quadrangular facets, comprising a depressed adaxial facet, a dihedral pair of lateral facets meeting in the apico-adaxial region, a large abaxial facet, and a dihedral pair of lateral facets that form the basidiospore base (Pegler & Young 1978, 1979).

There are 14 species with cuboidal basidiospores cited for Brazil: *Entoloma caribaeum* (Pegler) Courtec. & Fiard (Coimbra et al. 2013), *Entoloma dragonosporum* (Singer) E. Horak (Singer 1965, Horak 1982, Singer & Aguiar 1986, Meijer 2001, 2006, Wartchow 2006, Coimbra et al. 2013), *Entoloma lycopersicum* E. Horak & Singer (Horak 1982), *Entoloma murrayi* (Berk. & M.A. Curtis) Sacc. (Sobestiansky 2005, Meijer 2006), *Entoloma pinnum* (Romagn.) Dennis (Putzke & Cavalcanti 1997, Meijer 2006 as cf.), *Entoloma viscaurantium* E. Horak & Singer (Horak 1982), *Rhodophyllus fraternus* Singer (Singer 1973, Horak 1976, 1977), *Inocephalus azureoviridis* (E. Horak & Singer) Karstedt & Capelari (Horak 1982, Souza & Aguiar 2004 as cf., Karstedt & Capelari 2013), *Inocephalus cervinus* Karstedt & Capelari (Karstedt & Capelari 2013), *Inocephalus dennisii* (E. Horak) Karstedt & Capelari (Capelari 1989 as cf., Karstedt & Capelari 2013), *Inocephalus tenuis* Karstedt & Capelari (Karstedt & Capelari 2013), *Inocephalus virescens* (Berk. & M.A. Curtis) Largent & Abell-Davis (Pegler 1997, Alves & Nascimento 2012, Karstedt & Capelari 2013), *Inopilus kamerunensis* (Bres.) Pegler (Pegler 1997) and *Nolanea avilana* Dennis (Capelari 1989 as cf., Meijer 2006 as aff., Coimbra et al. 2013). The last seven have been collected in the state of São Paulo, and two (*I. azureoviridis* and *I. cervinus*) occur in Reserva Biológica de Paranapiacaba.

To describe the new species this work adopted the *Entoloma sensu lato* concept, which includes all species with basidiospores that are angular in all views (Noordeloos & Gates 2012).

Materials & Methods

The new species was collected during a taxonomic survey of Reserva Biológica de

Paranapiacaba, an Atlantic Forest remnant in Santo André City, in the São Paulo Metropolitan Region, São Paulo State, Brazil. The macroscopic descriptions of basidiomata was based on fresh material. Color terms are according Küppers (2002). The microscopic analyses and SEM preparations used follow those presented in Karstedt & Capelari (2010, 2013). The specimen was deposited at SP (Thiers 2014).

Results

Taxonomy

Entoloma largentianum Karstedt & Capelari, **sp. nov.**

Figs 1–2

MycoBank 810790

Etymology – in honor of David Lee Largent for his contribution to knowledge of *Entolomataceae*.

Pileus 40 mm diam., convex-umbilicate, brown (near N₆₀Y₉₀M₅₀) slightly reddish, hygrophanous, surface glabrous, translucent-striate at margin, margin slightly irregular. Pileus context thin. Lamellae decurrent, narrow, moderately close, grayish pink (N₃₀Y₂₀M₃₀), with 2–3 series of lamellulae, smooth margin, the same color as the faces of the lamella. Stipe 43 × 6 mm, cylindrical, centrally attached, cream (beige), longitudinally striate, slightly fibrillose, fibrous, hollow, base tomentose, mycelium white. Basidiospores cuboidal, with six faces each of which is quadrangular, 7.5–8.7 × 7.5–8.7(–10) μm [$x_m = 8.65 (\pm 0.3) \times 8.26 (\pm 0.59) \mu\text{m}$, Q = 1–1.16, Q_m = 1.05 (±0.07), n = 20] and 10–11.2 × 10–11.2 μm [$x_m = 10.89 (\pm 0.55) \times 10.57 (\pm 0.62) \mu\text{m}$, Q = 1–1.12, Q_m = 1.03 (±0.05), n = 20] in diagonal, slightly pinkish brown, thin-walled. Basidia clavate, 35–45 × 10–12.5 μm (n = 20), hyaline, thin walled, with 4 sterigmata. Cheilocystidia and pleurocystidia dispersed, fusoid, fusoid-ventricose, ventricose, ventricose-rostrate, sometimes collapsed, 51–75 × 12.5–21 μm (n = 13), hyaline or slightly brownish with brown intracellular pigment, thin-walled. Pseudocystidia absent. Lamellae trama comprising subparallel hyphae, cylindrical or inflated, sometimes branched, 3.7–12.5 μm diam. (n = 20), hyaline, thin-walled, a few septa, much branched hyphae in the subhymenium. Pileal trama comprising radially entangled hyphae, cylindrical, cylindrical-inflated, mostly collapsed, 3.7–18 μm diam. (n = 10), hyaline, thin-walled, septate. Pileipellis comprising prostrate and slightly entangled hyphae, cylindrical, 5–17.5 μm diam. (n = 20), hyaline, thin-walled; terminal hyphae prostrate, slightly clavate or cylindrical-clavate. Stipitipellis a cutis, with cylindrical hyphae, 2.5–6.2 μm diam. (n = 20), hyaline or straw yellow, thin-walled, septate. Clamp-connections present. Refractive hyphae absent.

Habitat – solitary, on soil.

Known distribution – in tropical region, in Atlantic Forest.

Material examined – Brazil, São Paulo State, Santo André, Reserva Biológica de Paranapiacaba, 23 March 2009, M. Capelari & L.A. Silva Ramos 4450 (SP) Holotype.

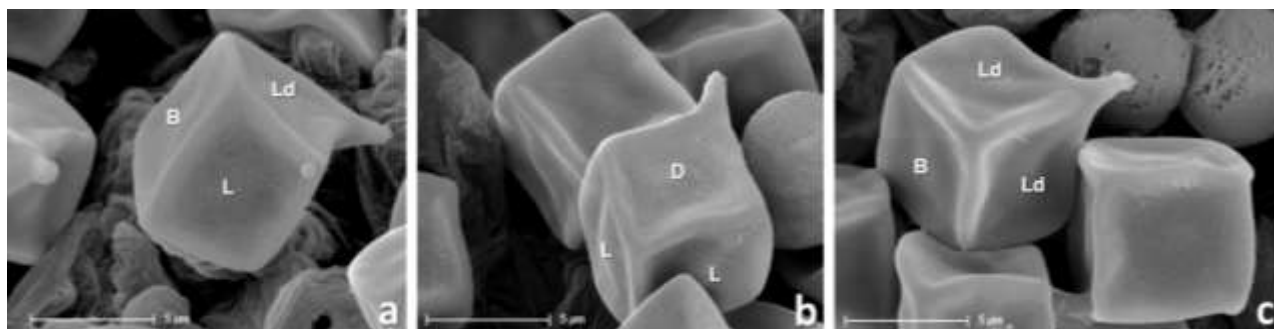


Fig. 1 – SEM of *Entoloma largentianum* basidiospores. B: abaxial facet, D: adaxial facet, L: lateral facets, Ld: dihedral pair of lateral facets. Scale: a-c: 5 μm. Photos by F Karstedt.

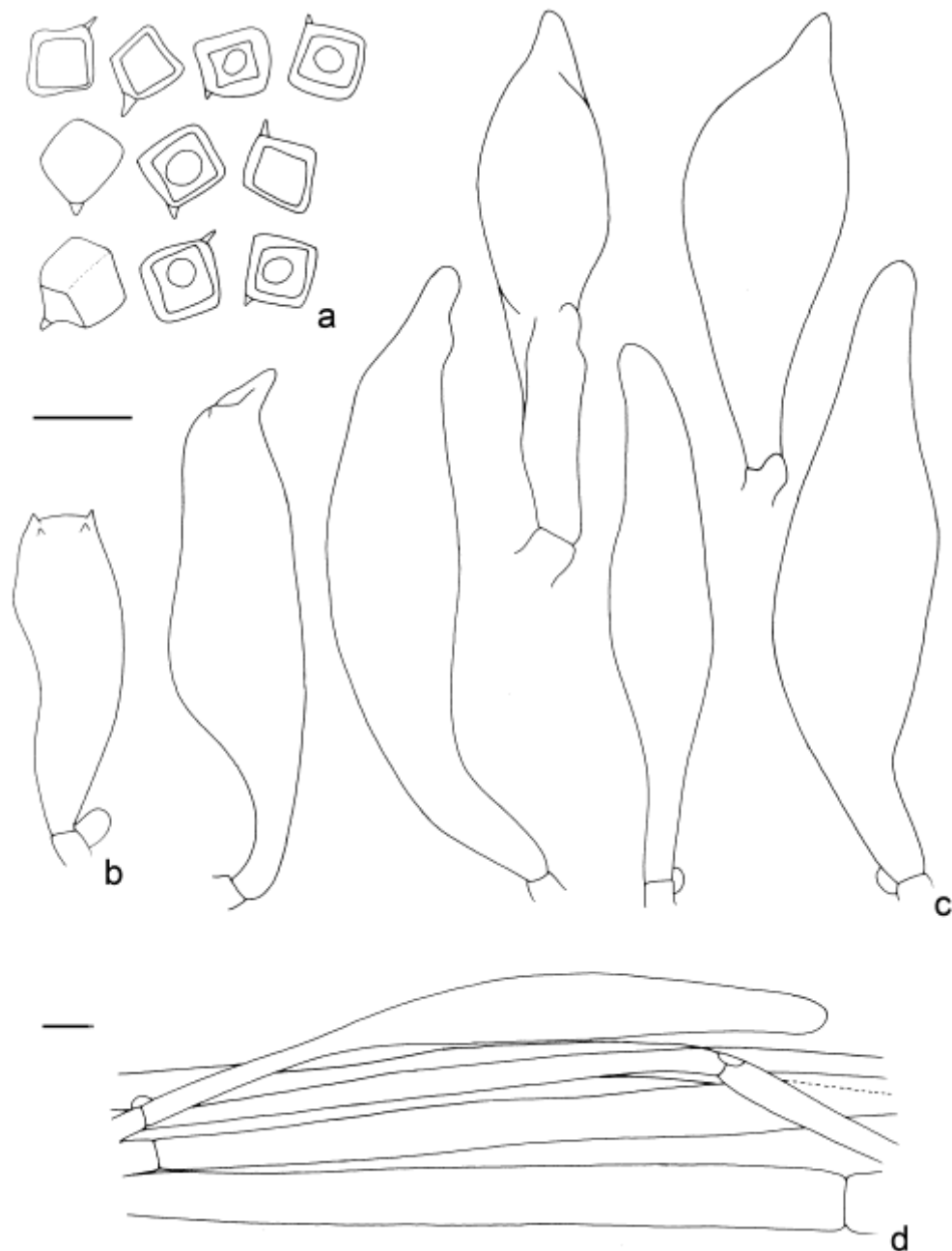


Fig. 2 – *Entoloma largentianum* (MC4450): **a.** basidiospore; **b.** basidia; **c.** cheilocystidia; **d.** pileipellis. Scales: a-d: 10 μ m. Drawings by F Karstedt.

Discussion

All species with cuboidal basidiospores cited for Brazil differ from *Entoloma largentianum* because they have a convex or conic pileus, adnate or adnexed lamellae and cylindric or clavate cheilocystidia, instead of an umbilicate pileus, decurrent lamellae and fusoid cystidia.

The only species that resemble *Entoloma largentianum*, because they have omphalinoid basidiomata (with an umbilicate pileus and decurrent lamellae), cuboidal basidiospores and fusoid cystidia, are *Leptonia omphalinoides* Largent from Australia and *Entoloma infundibuliforme* Petch from Sri Lanka.

Leptonia omphalinoides differs from *E. largentianum* by its lignicolous habit, smaller basidiomata, 6–11 mm diam. pileus, pileus surface that is minutely squamulose with squamules that are erect towards the margin, and smaller basidiospores that measure 4.6–8.4 \times 3.7–6.7 μ m (Largent et al. 2013).

Entoloma infundibuliforme Petch *sensu* Horak (1976) differs by having a pileus surface that is densely covered with fibrillose-squamous scales in the central region and by its smaller basidiospores (5.5–8 µm). The material determined by E. Horak as *E. infundibuliforme* (1976, ZTMyc42836, old number ZT72/487) was analyzed and cuboidal basidiospores and fusoid cystidia were observed. However, collections of this species, including the type, need to be reviewed because Horak (1976) described the species with cuboidal basidiospores and fusoid cystidia and treated *E. infundibuliforme* Petch as a synonym of *Entoloma infundibuliforme* Hesler (a *nomen rejiciendum* that was given a new name, *Entoloma perumbilicatum* Hesler). Further, Pegler (1986) mentioned that this species has pentagonal and square basidiospores in profile and fusoid cystidia but previously (in 1978) he had described the same collection with the same basidiospore shape but without cheilocystidia. Additional studies are needed to determine whether *E. infundibuliforme* has six faces quadrate or some faces pentagonal basidiospores, or if this species has two types of basidiospores.

Acknowledgements

The authors thank FAPESP (Fundação de Amparo à Pesquisa do Estado de São Paulo 2010/10218-5) for the financial support.

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