Neotropical Biology and Conservation
7(3):158-161, september-december 2012

Leucocoprinus fluminensis (Agaricaceae, Basidiomycota), a new species from southwest Brazilian Rain Forest

Leucocoprinus fluminensis (Agaricaceae, Basidiomycota), uma nova espécie para a Mata Atlântica do sudeste brasileiro

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Abstract

Leucocoprinus fluminensis sp. nov. was collected on an Agaricales (Basidiomycota, Basidiomycetes) survey expedition, made in patches of Rain Forest at the Biological Reserve of Tinguá, surroundings of Nova Iguaçú, Rio de Janeiro state, Brazil, and described as a new species. A usual methodology for collection and identification of Agaricales mushrooms was applied. The new species is characterized by reddish-brown center pileus and weakly dextrinoid spores in Melzer's reaction.

Key words: Agaricaceae, Atlantic Rain Forest, Rio de Janeiro.

Resumo

Espécimes de *Leucocoprinus fluminensis* sp. nov foram coletados em uma expedição de pesquisa de fungos Agaricales (Basidiomycota, Basidiomycetes), realizada em fragmentos de floresta tropical na Reserva Biológica do Tinguá, situada nos arredores de Nova Iguaçu, Estado do Rio de Janeiro, Brasil, sendo descritos como uma nova espécie. A metodologia usual para coleta e identificação de cogumelos Agaricales foi aplicado. A nova espécie é caracterizada por apresentar o centro do píleo marrom-avermelhado e esporos fracamente dextrinóides em reação de Melzer.

Palavras-chave: Agaricaceae, Mata Atlântica, Rio de Janeiro.

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Introduction

The Atlantic Rain Forest of Rio de Janeiro State, located southwest in Brazil, shows a great diversity of Agaricales still little known. During a field expedition in the Biological Reserve of Tinguá, Rio de Janeiro, a specimen of *Leucocoprinus* with distinct features from others in that genus was found. The following species occur in Brazil: *Leucocoprinus birnbaumii* (Corda) Singer (Albuquerque *et al.,* 2006; Grandi *et al.,* 1984; Pegler, 1997), *Leucocoprinus brebissonii* (Godey) Locq (Albuquerque *et al.,* 2006; Pegler, 1997). *Leucocoprinus cepaestipes* (Sow. Fr.) Pat. (Bononi *et al.,* 1981), *Leucocoprinus citrinellus* (Speg) Raith. (Albuquerque *et al.,* 2006), *Leucocoprinus cretaceus* (Godey) Locq. (Sobestiansky, 2005), *Leucocoprinus cristatulus* (Rick) Raith., *Leucocoprinus fibrillosus* Raith. (Albuquerque *et al.,* 2006), *Leucocoprinus fragilissimus* (Rav.) Pat. (Albuquerque *et al.,* 2006; Bononi *et al.,* 1981, Pegler 1997) *Leucocoprinus noctiphilus* (Ellis) Heinem., *Leucocoprinus phaeopus* (Rick) Raith., *Leucocoprinus proletarius* (Rick) Raith., *Leucocoprinus revolutus* (Rick) Raith. (Albuquerque *et al.,* 2006) *Leucocoprinus venezuelanus* Dennis (Pegler, 1997). Recently a new species, *Leucocoprinus brunneoluteus* Capelari & Gimenes, was described for São Paulo (Capelari and Gimenes, 2004), contributing to the knowledge of this genus, as well for the diversity of these mushrooms in Brazil.

Material and methods

Standard methods for describing the basidiomes were applied, using the terminology of Pereira and Putzke (1990), Vellinga and Noordeloss (2005) and Putzke and Putzke (2004). Color annotations in the macroscopic descriptions are from Küppers (2002). The microscopic annotations were made with fresh and dehydrated samples. Cortical and hymenial layer cuts were used to take the photomicrographs. Melzer's reagent, Congo Red and KOH (5%) were used to dye the histological preparations. An Olympus optic microscope was used to observe the microscopic features

Taxonomy

Leucocoprinus fluminensis Albuquerque & Victoria, sp. nov. (Figures 1, 2)
TYPE. BRAZIL. RIO DE JANEIRO: Nova Iguaçú, Rebio Tinguá, Estrada do Itacolomi, 22º 35' 03.4"S – 43º 24' 47.4"W. Alt. 97m elev., 14 Oct. 2004, M.P. Albuquerque 38-III. (HOLOTYPE designed here, RB 417264).
Etymology. Fluminensis is the Latinized, masculine version to the Portuguese "fluminense" used to nominate those born in Rio de Janeiro State, because this species was found in this Brazilian state.
Pileus 45-60 mm, membranaceus, planus, umbonatus, ad centrum brunneus vel rubro et in squamulis brunneis excoriato, margine striata. Lamellae libera, collariatae, xanthae vel albae. Stipes 60-100 x 6 mm, cilindricus, haud bulbosus, glabrae vel fibrillosus, membranaceus, xathae-floccosus, annulo simplice xanthus vel rubris. Caro fragillima, alba. Sporarum pulvis alba. Sporae 5.5-8.1 x 4.9-6.1 µm, ellipsoglobosus, debilis dextrinoideae. Cheilocystidia de lageniformis 11-49,5 x 5,1-16 µm ad sphaerum-penducularis 22-48 x 5,1-11 µm. Pilei himenidermis ex hyphis cilindricus, rare sphaeris, haud septateae. Fibulae absentes. Leucocoprinus castroi *simillima, sed in pileus centris coloris differt.*
Pileus 45-60 mm, cream colour, membranaceus, plane, umbonate, brownish to purple scales, sligth at edge. Pileus margin striate until the central of the discus with slight reddish-brown scales at discus. *Lamellae*, free with colarium, not crowded, slightly ventricose

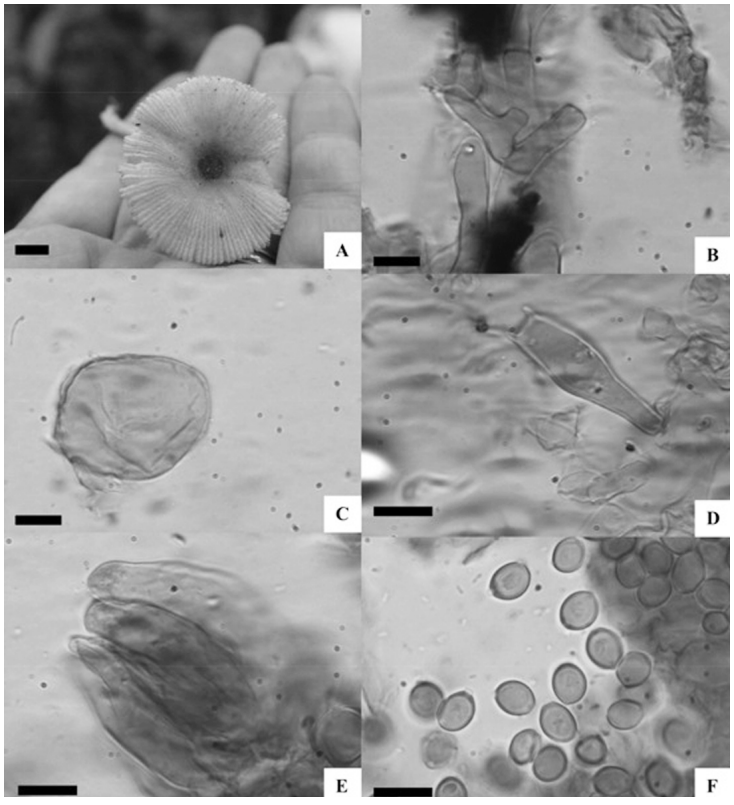

Figure 1. *Leucocoprinus fluminensis*. A. Basidiocarps; B. pileitrama inflated hyphae; C. pileitrama sphaerocysts; D. Basidia; E. cheilocistidia; F. spores. Bars: A= 1 cm, B-C= 20 mm, D-F= 10 mm. (Photo Margéli Albuquerque).

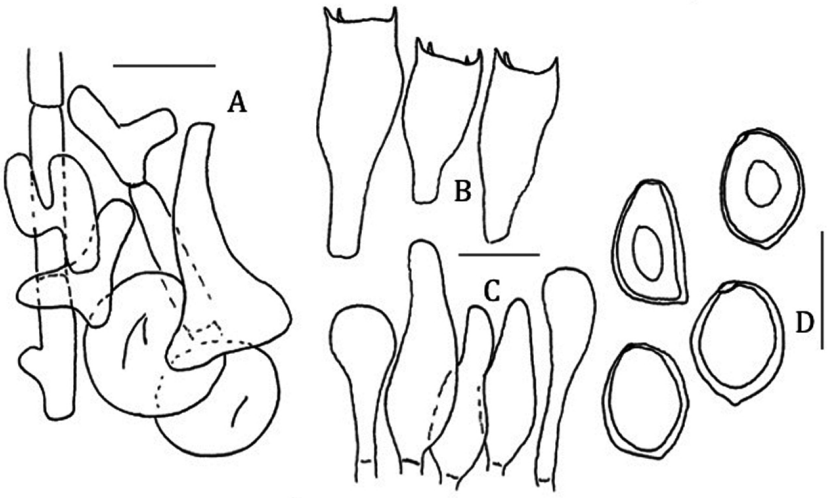

Figure 2. *Leucocoprinus fluminensis*. A. pileitrama elements; B. Basidia; C. cheilocistidia; D. spores. Bars: A= 20 mm, B-D= 10 mm.

up to 3 mm wide, distinctly cream yellowish at first, later yellowish, with con colorous even edge. Stipe, 60-100 x 6 mm, cylindrical, yellow to pinkish, glabrous to sligthtly fibrilose, membranaceus. Ring single, white, high, ascendant.

Basidiospores (n= 25 from hymenial surface with Melzer reagent) 5.5-8.1 x 4.9-6.1 µm, avl X avw= 6.84 X 5.53 µm, Q= 1.12-1.40, avQ= 1,27, elliptical-globose, hyaline, twin-walled, eccentric hilar appendix, prominent germinative pore, weakly dextrinoid in Melzer's reagent. Basidia 16-19 x 11- 9.2 µm, hyaline, clavate, 4 sterigmatate. Cheilocystidia in two types, lageniformes 11- 49,5 x 5,1- 16 µm, hyaline, sphaesropedunculate, 22-48 x 5,1- 11 µm, hialine. Pileitrama made up of a mix of thin and long non-septate hyphae with rounded apex, forming a hymenioderm or with branched short cylindrical elements and rare sphaerocysts. Clamp connections absent.

Habit: Soil in edge of Forest, gregarious.

Collection examined. Brasil. Rio de Janeiro: Nova Iguaçú, Rebio Tinguá, Estrada do Itacolomi, 22º 35' 03.4"S – 43º 24' 47.4"W. Alt. 97m elev., 14 Oct. 2004, M.P. Albuquerque 38-III (HOLOTYPE RB 417264).

Discussion

Leucocoprinus fluminensis stand out among other yellowish *Leucocoprinus* species on account of its pileus shape and center discus color, spore size, weakly dye of spores in Melzer's reagent and greatest number of cheilocystidia. Some characteristics as pileus surface elements, formed by long cylindrical and short branched hyphae like a puzzle, elliptic globose basidiospores, basidioma aspects (membranaceus and long striate pileus surface) permits approximate the Rebio-Tinguá sample within *Leucocoprinis castroi* Blanco-Dios. The Brazilian rain forest specimen differs at central discus color, as a reddish-brown umbonate discus. Blanco-Dios (2003) remarks the Spanish species with an ochraceous to yellow discus. Other divergent characters are the Melzer's reaction on basidiospores and the greatest occurrence of cheilochystidia. *Lc. castroi* has dextrinoid spores and our specimens show weakly dextrinoid. The cheilocystidia in Blanco-Dios species are rare, varying from fusiform to lageniform. In Tinguá samples the hymenial structure has a similar morphology as *Lc. castroi* but this structure is more frequent in our collection.

Other Brazilian *Leucocoprinus* species recently described as *Lc. brunneoluteus* (Capelari and Gimenes) differ from *Lc. fluminensis* by the pileitrama context elements, where in that species was not similar to puzzle hyphae. This pileitrama characteristic associated to an evident germ pore gives to *Lc. fluminensis* a particular evidence that it was included together with other *Leucocoprinus* section-like species, as *Lc. birbaurmii, Lc. brebissoni, Lc. cretaceus, Lc. fragilissimus*, *Lc. lilacinogranulosus, Lc. magniocystidious* and others (Bon, 1981; Candusso and Lanzoni, 1990; Findeisen, 1965; Pegler, 1977, 1983; Reid and Eicker, 1993; Raithelhuber, 1991; Smith and Weber, 1982). The pileus central discus color and the spores sizes and shape are the mainly divergent characteristics to separate *L. fluminensis* from these species.

For this reason the Brazilian specimen has not been determinated within the others *Leucocoprinus* species (Blanco-Dios, 2003; Candusso and Lanzoni, 1990; Breitenbach and Kränzlin, 1995; Pegler, 1983, Wrigth and Albertó, 2002; Didukh *et al.*, 2003) indicating it as a new species.

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Submitted on October 7, 2011
Accepted on June 6, 2012