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## SOME CONSIDERATIONS ON *RIPARTITELLA BRASILIENSIS*

### Abstract

*The macro-, microscopical and ecological features of Ripartitella brasiliensis, a relatively common pantropical taxon, are reported based on a collection from the Paraná State, Brazil. A comparison with the very close Ripartitella alba are carried out and colour photographs of basidiomata and some microscopic structures are provided, along with a black and white plate illustrating the microscopical characters. Concise considerations of molecular nature and data about its distribution all over the world are referred.*

### Riassunto

*Vengono riportate le caratteristiche macro-, microscopiche ed ecologiche di Ripartitella brasiliensis, specie pantropicale relativamente comune, sulla base di una collezione effettuata nello stato del Paraná, Brasile. Viene presentato un raffronto con specie simili, nonché forniti dei fotocolor dei basidiomi e di alcuni elementi microscopici, assieme ad una tavola in bianco e nero illustrante i microcaratteri. Vengono, infine, riferite alcune sintetiche considerazioni di natura molecolare e sulla distribuzione di tale entità a livello mondiale.*

**Key words:** Agaricales, *Ripartitella alba*, *Ripartitella brasiliensis*, Brazil, taxonomy, tropics.

### Introduction

Tropical fungi, also the commonest, can be very interesting for European mycologists because they are a kind of mysterious objects that stimulate their curiosity, besides they permit to improve their mycological expertise. For the aforementioned reasons we studied a collection of *Ripartitella brasiliensis* (Speg.) Singer.

### Materials and methods

The photographs of the basidiomata were taken *in situ* (Fig. 1) by a Nikon D90 digital camera. The macromorphological characters were observed in fresh specimens, while the microscopic analyses were made from sections of revived tissues that were mounted in distilled water, in a saturated, aqueous solution of NaCl or in 5% KOH. Congo red also was used to stain hyaline structures.

Technical terms used for describing the morphological characters refer to SINGER (1986) and VELLINGA (1998).

Authors of fungal names follow Index Fungorum ([www.indexfungorum.org/Names/AuthorsOfFungalNames.asp](http://www.indexfungorum.org/Names/AuthorsOfFungalNames.asp)) and Mycobank ([www.mycobank.org](http://www.mycobank.org)) web pages. Voucher specimens are housed at authors' herbaria and deposited in MCVE (29084).

### TAXONOMY

***Ripartitella brasiliensis*** (Speg.) Singer, Lilloa 22:452 (1949) 1951

Basionym: *Pleurotus brasiliensis* Speg., Boletín de la Academia Nacional de Ciencias en Córdoba 11 (4): 398 (1889)

## Synonymy

- = *Dendrosarcus brasiliensis* (Speg.) Kuntze, Revisio generum plantarum 3: 463, 1898.
- = *Marasmius squamosidiscus* Murrill, Bull. Torrey Bot. Club 67: 151, 1940.
- ≡ *Ripartitella squamosidisca* (Murrill) Singer, Mycologia 39: 85, 1947.
- = *Lentodium floridanum* Murrill, Mycologia 35: 426, 1943.
- = *Collybia pseudoboryana* Dennis, Trans. Brit. Mycol. Soc. 34: 453, 1951.
- = *Lepiota armillarioides* Dennis, Kew Bull. 7: 486, 1952.

## Original diagnosis

Spegazzini, C. 1889. *Fungi Puiggariani. Pugillus 1*. Boletín de la Academia Nacional de Ciencias en Córdoba. 11(4): 381-622.

### 31. *PLEUROTUS BRASILIENSIS* Speg. (n. sp.)

*Tricholomatarius; pileus centralis carnosulus convexus laevis glaber laete fulvo-lateritius v. rufescens; lamellae adnatae confertae albae; stipes incurvus teres albus laevis glaber; sporae leaves hyalinae.*

*Hab. Ad corticem truncorum putrescentium in sylvis prope Apiahy Maj. 1888 (sub n. 2886-88).*

## Description

**Habit** collybioid.

**Pileus** up to 21 mm broad, convex to applanate; surface dull, white covered with brownish to rusty-brown squamules denser in the centre, not hygrophanous; margin often appendiculate by white veil remnants.

**Lamellae** very crowded, segmentiform, up to 2-3 mm broad, adnexed to adnate, white; edge entire and concolorous.

**Stipe** 11-30 × 2-4 mm, central to slightly eccentric, cylindrical, equal or slightly enlarged at apex, fragile, white at the apex, pale yellowish with scattered beige or brownish squamules below; annulus evanescent, thin, white. Base provided with white hairs.

**Context** scanty, odourless with mild taste.

**Spore print** not recorded.

**Spores** (3-)4-5 × 3-4.2 μm (average values: 4.4 × 3.7 μm). Q = 1.1-1.3; they are subglobose to broadly ellipsoidal, hyaline, thin-walled, inamyloid, not dextrinoid, cyanophilic, echinulate (up to 0.5 μm), usually with a large central guttule and deprived of germ pore.

**Basidia** 19-28 × 5-7 μm, clavate, 4-spored; sterigmata up to 4 μm long.

**Cheilocystidia** absent. Scattered cystidioid hairs have been observed; they are hyaline, cylindrical or sinuous, thin-walled, 15-30 × 3-5 μm.

**Pleurocystidia** 30-47 × 6-8(-10) × 2.5-4 μm, uni- or bi-cellular, lageniform, hyaline, inamyloid, thick-walled, about 0.5 μm, with apex often covered with crystals dissolving in KOH.

**Hymenophoral trama** subregular, made up of cylindrical, septate, thin-walled, hyaline hyphae, 9-12(-20) μm wide, with clamp-connections.

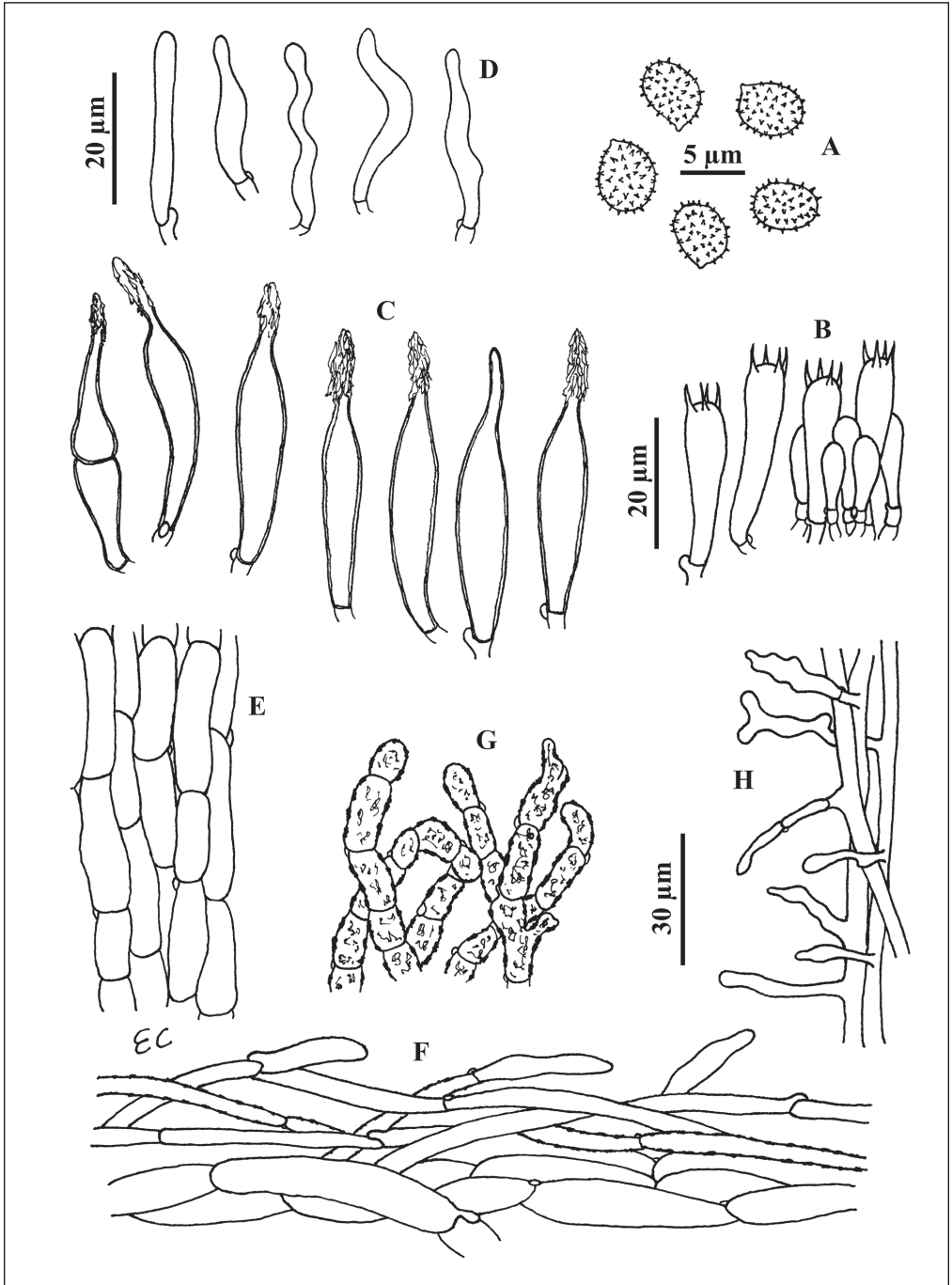
**Pileipellis** a cutis of thin-walled, cylindrical hyphae, hyaline 3-6.5 μm wide, with terminal cells provided with obtuse or tapering apex. The squamules are composed of chains of short or sub-isodiametric hyphae, 5-12 μm wide, strongly encrusted with a yellow-brown pigment.

**Subpellis** a layer of subparallel or interwoven hyaline, cylindrical hyphae, 7.5-16 μm wide.

**Stipitipellis** a cutis of parallel, cylindrical, septate, inamyloid hyphae 3-6 μm wide, with cylindrical, sinuous or branched protrusions.

**Stipe trama** composed of cylindrical, sometimes inflated, hyphae 8-12 μm wide.

**Clamp-connections** present in all tissues.



*R. brasiliensis*. A: spores; B: basidia; C: pleurocystidia; D: cystidioid hairs; E: hymenophoral trama; F: pileipellis; G: hyphae of the squamules; H: stiptipellis.  
 Drawings by Emanuele Campo



*Ripartitella brasiliensis*

Photo by Paolo Picciola

**Ecology** gregarious to caespitose on decayed wood in a broadleaved forest.

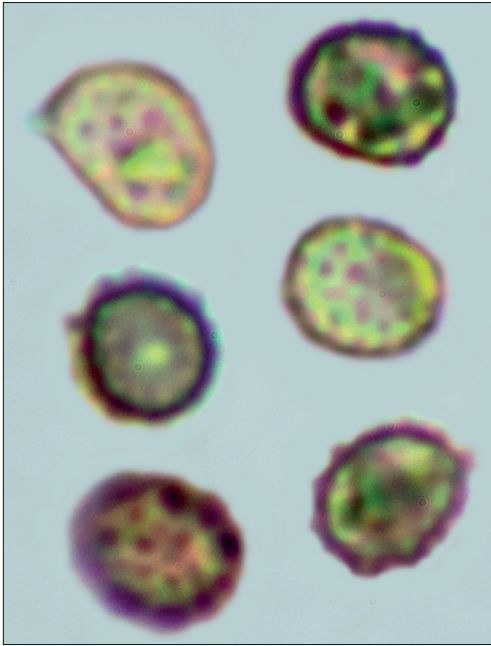
**Phenology** 03 Apr. 2015.

**Collections studied** Brazil, Paraná State, locality Campina Grande do Sul, sixteen basidiomes, leg. & det. P. Picciola.

### Discussion

The genus *Ripartitella* has been introduced by SINGER (1947) who in 1986 gave the following description of the genus: “Habit of the carpophores reminiscent of *Lepiota* but with the lamellae variably attached, and the stipe sometimes more or less eccentric; pigment rusty, incrusting the walls of the hyphae; pileus squamulose, the squamules consisting of somewhat intermixed, dense chains of short hyphal members which are almost isodiametric to elongate and cylindric but do not assume the shape of spherocysts; lamellae adnate to emarginated or separating from the apex of the stipe, or decurrent with a tooth; spore print white or nearly so; spores hyaline, echinulate, ellipsoid to subglobose, much like those of *Clitocybe inversa*, cyanophilic, inamyloid, without germ pore; basidia normal, 4-spored, cystidioles very conspicuous in most specimens although often scarce and or collapsed, strongly reminiscent of those of *Melanoleuca*, hyaline, thin-walled-to medium thin-walled, with crystalline, sagittate incrustation above, ampullaceous or subulate, on the sides of the lamellae as well as on the edge, trama of the hymenophore regular, hyaline, consisting of thin-walled hyphae; stipe often eccentric, indistinctly or distinctly veiled but annulus rarely developed; base with short white strands of rhizomorphs (as, for that matter, in many Agaricaceae); context fleshy, consisting of hyphae with clamps connections and inamyloid walls; on the ground and on decaying wood.”

Spegazzini’s description of *Pleurotus brasiliensis* Speg. (1889), the basyonim of *Ripartitella brasiliensis*, derived from specimens found in southern Brazil.



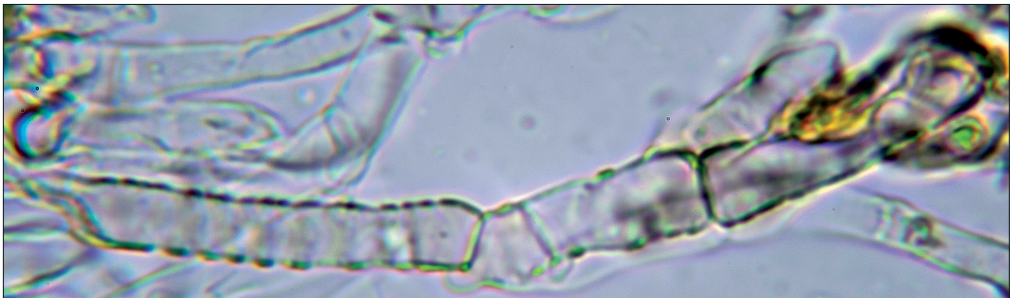
*R. brasiliensis*. Spores.

Photo by Emanuele Campo



*R. brasiliensis*. Pleurocystidia.

Photo by Emanuele Campo



*R. brasiliensis*. Hypha of the squamules of pileus.

Photo by Emanuele Campo

Murrill reported the taxon in question as *Marasmius squamosidiscus* Murrill (1940), and *Lentodium floridanum* Murrill (1943), while DENNIS (1951) named it as *Collybia pseudoboryana* Dennis and later (1952) as *Lepiota armillarioides* Dennis.

Actually at first sight in the field it reminds a *Lepiota* sp. because of its collybioid habit and the presence of squamulose pilei; other features useful in the identifications are: small size, general white colours, crowded lamellae, fleeting annulus and growth on decayed wood.

As observed by SINGER (1949), the microscopical features are a mix of different Genera: spores similar to those of some *Lepista* (Fr.) W.G. Sm., pleurocystidia as in several *Melanoleuca* Pat. and protrusion on stipitipellis much like of some *Mycena* (Pers.) Roussel.

Its taxonomic collocation has not been definitively ascertained yet: SINGER (1945, 1986) placed *R. brasiliensis* in the *Agaricaceae* Chevall., *tribu Cystodermatae* Singer, while others (PEGLER, 1977; 1983; OVREBO, 1988; FRANCO-MOLANO, 1993; JOHNSON & VILGALYS, 1998) transferred it to *Tricholomataceae* R. Heim ex Pouzar. MONCALVO & AL. (2002) even concluded that the taxonomic position of *Ripartitella* remains unresolved and further analyses are needed.

Dictionary of the Fungi (KIRK & AL., 2008) places *Ripartitella* Singer, *Cystoderma* Fayod and *Cystodermella* Harmaja in *Agaricaceae* but points out that more studies on a larger number of taxa are necessary in order to collocate these genera in a definitive family.

Recent analyses of partial LSU rDNA sequences (SAAR & AL., 2009) revealed *Cystoderma* and *Cystodermella* as distinct monophyletic genera, with *Ripartitella* representing a well-supported sister group of the latter.

*Ripartitella alba* Halling & Franco-Mol. differs from *R. brasiliensis* "by having a less squamulose to glabrous pileus, less and different pigmentation, smaller habit, wider spacing between lamellae, smaller spores and smaller cystidia. Also *R. alba* lacks the narrow outgrowths on hyphae of the pileipellis that Ovrebo (1988) described for *R. brasiliensis*".

By observing the colour photograph of *R. alba* included in "Common Mushrooms of the Talamanca Mountains, Costa Rica" (HALLING & MUELLER, 2005) despite the subtle morphological differences between *R. alba* and *R. brasiliensis* we get the impression that it really represents a different taxon in respect to our collection.

We find very odd that in his descriptions of *Ripartitella brasiliensis*, PEGLER (1977) stated that cystidia are absent or did not mention them (1983). In our humble opinion two hypothesis can be made: the first and the more probable is that for mysterious reasons he did not see them, while the second is more fascinating but less likely that is there exist specimens of *R. brasiliensis* deprived of hymenial cystidia; in this case perhaps it would be appropriate to rename this taxon.

Regarding the DNA the ITS sequence of *R. alba* from type material (Accession NR119479.1) shows a 96% identity with an homologous sequence of *R. brasiliensis* (Accession AM946524.1): the two aligned sequences differ by twenty-one nucleotides and four gaps.

With regard to its distribution the species in question was found in the U.S.A. (OVREBO, 1988), Mexico (GUZMAN-DAVALOS & GUZMAN, 1988; BANDALA & AL., 2005), Brazil (CAPELARI & ASAI, 2009; WARTCHOW & AL., 2007), Kenya, Tanzania, Uganda (PEGLER, 1977), Polynesia (OVREBO, 1988), Japan (HONGO, 1977; 1986) throughout tropical and subtropical regions.

SINGER (1986) even reported some finds (adventitious?) in Europe (Czech Republic and Hungary).

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