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Article *in* Brazilian Journal of Botany · June 2014

DOI: 10.1007/s40415-014-0048-3

2 authors:

Altielys Casale Magnago
Universidade Federal do Rio Grande do Sul
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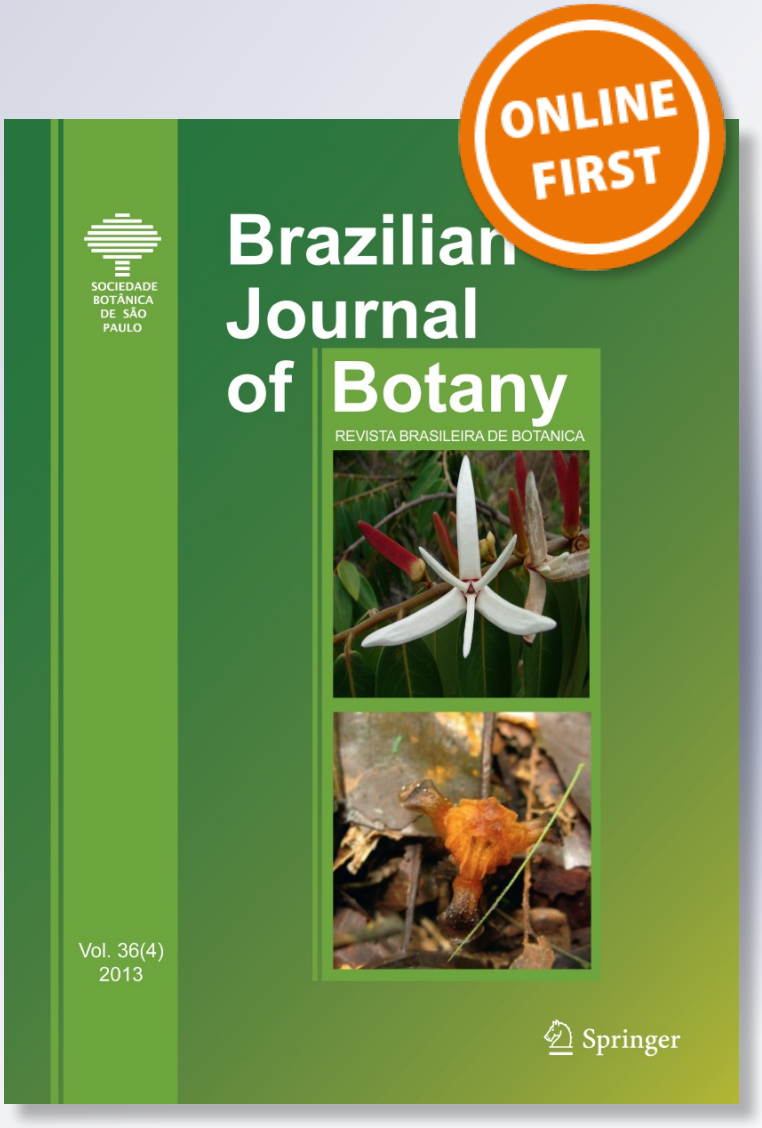
Brazilian Journal of Botany

ISSN 0100-8404

Braz. J. Bot
DOI 10.1007/s40415-014-0048-3



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Braz. J. Bot
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SHORT COMMUNICATION

New record of *Austroboletus festivus* (Boletaceae) from Santa Catarina, Brazil

Altielys Casale Magnago · Maria Alice Neves

Received: 8 October 2013 / Accepted: 22 January 2014

Abstract The Atlantic forest is a biodiversity hotspot and harbors a great variety of fungi, many still undiscovered. Basidiomes were collected in coastal *restinga* on remnants of Atlantic forest in Florianópolis Island, Santa Catarina. This is the first record of *Austroboletus festivus* for the state and expands its geographic distribution, previously known in Brazil only for Pernambuco and Paraná. Color images of the basidomes, microscopic illustrations and scanning electron microscopy of the basidiospores are presented.

Keywords Agaricomycetes · Atlantic forest · Boletales · Systematic

Introduction

Austroboletus was proposed by Wolfe (1979) to accommodate species with tubulate hymenophore, dry or viscid pileus mostly covered by a trichodermium or ixotrichodermium pileipellis, a vinaceous brown to army brown spore print, elongated-fusoid ornamented spores, and cystidia generally without pigments or pseudoamyloid internal bodies (Singer 1986). Thirty species are known for the genus (Kirk et al. 2008), with ca. ten species in the neotropics (Singer 1986; Singer et al. 1983, 1991; Halling et al. 2006; Fulgenzi et al. 2010). *Austroboletus* is somehow similar to *Tylopilus* P. Karst. and *Fistulinella* Henn., differing mainly by the ornamented spores in *Austroboletus*, while the other two genera have smooth spores (Singer 1986).

Records of *Austroboletus* from Brazil are very scarce. Four species have been reported for the country, three from Amazonas [*Austroboletus graciliaffinis* Singer, *Austroboletus olivaceus* Singer and *Austroboletus rionegrensis* (Singer & I.J.A. Aguiar) Singer] and one from Pernambuco and Paraná [*Austroboletus festivus* (Singer) Wolfe 1980] (Singer 1970; Watling and Meijer 1997). With the aim to improve the knowledge of boletoid fungi in the Atlantic forest, we present a new record of *A. festivus* from Brazil.

Materials and methods

Collections were conducted in March 2013 during the rainy season on the *restinga* at Parque Municipal das Dunas da Lagoa da Conceição, Florianópolis, Santa Catarina, Southern Brazil (27°36′46.22″S, 48°27′10.45″W). Macro and microscopic analysis of the material followed traditional methods used for basidiomycetes (Largent 1986; Largent et al. 1977). For scanning electron microscopy (SEM) of the basidiospores, fragments of the hymenophore were removed from dried basidiomes, mounted directly on aluminum stubs using carbon adhesive tabs, and coated with 30 nm of gold, and examined with a SEM operating at 10 keV. Color codes (e.g., OAC 663) are based on the Online Auction Color Chart (Kramer 2004). Voucher material was deposited at Herbarium FLOR from the Universidade Federal de Santa Catarina (Thiers, continuously updated).

Results and discussion

Austroboletus festivus (Singer) Wolfe, Biblthca Mycol. 69: 92 (1980) [1979] (Figs. 1, 2) =*Porphyrellus festivus* Singer, Publções Inst. Micol. Recife 304: 18 (1961).

A. C. Magnago (✉) · M. A. Neves
Programa de Pós-Graduação em Biologia de Fungos, Algas e Plantas, Departamento de Botânica, Centro de Ciências Biológicas, Universidade Federal de Santa Catarina, Campus Universitário Reitor João David Ferreira Lima, Trindade, Florianópolis, Santa Catarina CEP 88040-900, Brazil
e-mail: altielys@gmail.com

Published online: 08 February 2014

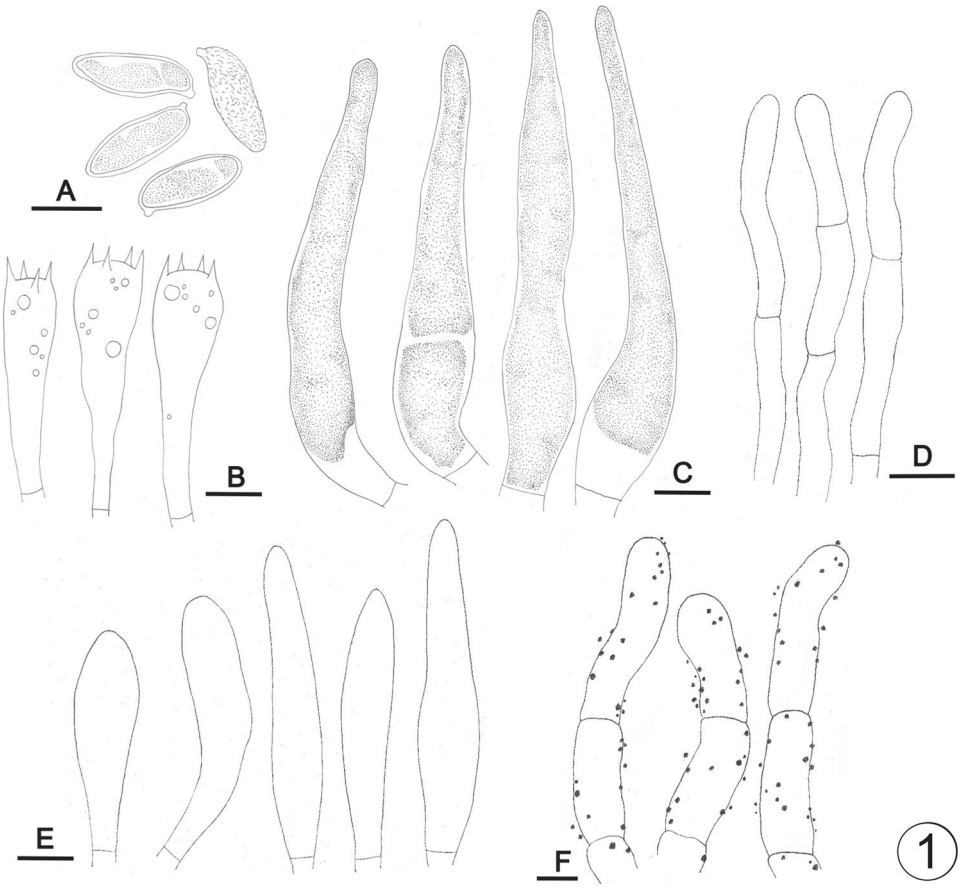

Fig. 1 Microcharacters of *A. festivus*. **a** Basidiospores; **b** Basidia; **c** Pleurocystidia; **d** Cheilocystidia filamentous; **e** Cheilocystidia ventricose to clavate; **f** Terminal hyphae of pileipellis. (*Bar* 10 μm)

Fig. 2 Basidioma in the field of *A. festivus* (*Bar* 1 cm)

Pileus 23–65 mm broad, at first convex, with age plano-convex to plane, surface entire fibrillose, becoming matted fibrillose with age, pinkish (OAC 795) with reddish brown fibrils (OAC 733), dry, becoming darker when bruised; margin entire; context 3–11 mm, whitish to cream, solid, unchanging. *Tubes* 8–16 mm long centrally, adnate, depressed around stipe, white at first, becoming sand dust (OAC 809) with age; tube mouths whitish to cream; pores 1–1.5/mm, angular, darkening when bruised. *Stipe* 72–87 mm long, 5–6 mm diam. at the top, 12–16 mm diameter at the base, central, sub-equal, tapering gradually upward, whitish at the apex, light brown (OAC 636) to

pinkish (OAC 795) downward; context solid, cream becoming purple blue to burgundy with some green tones when exposed, dark purple to almost black at the base; basal mycelium pink, conspicuous. *Basidiospores* 15–18 × 5–7 µm ($Q = 2.64$), fusiform to subfusiform, with suprahilar depression, pale yellow to pinkish in H_2O and 3 % KOH, inamyloid, surface slightly roughened reticulated, thick walled, hilar appendage 1 µm long. *Basidia* 33–50 × 9–12 µm, clavate, thin walled, hyaline in H_2O and 3 % KOH, inamyloid, 4-sterigmate, 3–5 µm long. *Pleurocystidia* 69–94 × 8–12 µm, frequent, aciculate to aculeate, golden yellow to orange in H_2O, light yellow in 3 % KOH, slightly pseudoamyloid. *Cheilocystidia* of two types: ventricose to clavate, 33–48 × 7–10 µm, hyaline in H_2O and 3 % KOH, inamyloid, observed in all basidiomes, and filamentous, 2–3 septate, round at the tip, 70–94 × 5–6 µm, hyaline, inamyloid, projecting beyond pore mouth in the young specimens resulting in a white colored hymenophore due to the large amount, but also observed in smaller amounts in mature basidiomes. *Hymenophoral trama* boletoid, mediostratum of many narrow parallel to interwoven hyphae, 4–6 µm wide, hyaline; lateral stratum hyphae 4–9 µm wide, hyaline, weakly divergent to subparallel. *Pileipellis* trichodermium, brown in H_2O, lighter in 3 % KOH; terminal cells 8–12 µm wide, cylindrical, rounded at the tip, granularly incrusted. *Pileus trama* interwoven; hyphae 5–16 µm wide, thin walled, hyaline. *Stipitipellis* repent 110–135 µm wide with interwoven hyaline hyphae, hyphae 3–5 µm wide, immersed in a gelatinized matrix, superficial hyphae with incrustations. *Caulocystidia* 42–78 × 5–8 µm, cylindrical, septate, hyaline, with small incrustations, scattered along the stipe surface. *Stipe trama* with parallel to subparallel hyphae, vertically arranged, hyphae 5–9 µm wide, light yellow in H_2O e KOH 3 %, some hyphae with gold brown granular contents. *Clamp connections* absent. *Macrochemical reactions:* NH_4OH on pileus surface bluing and fibrils turning burgundy, stipe surface bluing and context unchanging, or changing to light brown. *Spore print* cinnamon brown.

Ecology and distribution Solitary to scattered in white sandy soil under trees in *restinga*. In Brazil, the species have been registered to Pernambuco (Singer 1961) and Paraná (Watling and Meijer 1997). This is the first record to Santa Catarina. Also known from Guyana (Fulgenzi et al. 2010).

Material examined BRAZIL. Santa Catarina: Florianópolis. In white sandy soil in *restinga* between Praia da Joaquina and Avenida das Rendeiras (27°36′46.22″S, 48°27′10.45″W), 19/III/2013, *A.C. Magnago 564* (FLOR); 22/III/2013, *A.C. Magnago 573, 574, 575* (FLOR); 26/XI/2013, *A.C Magnago 847* (FLOR).

Commentary Austroboletus festivus is a distinctive bolete recognized in the field by its reddish brown densely matted-fibrillose pileus over a pinkish surface, white to sand dust hymenophore, a colorful context of the stipe ranging from reddish to blue-green when exposed, and a very evident pink basal mycelium. Microscopically, the Santa Catarina specimens agree with the descriptions by Singer (1970) for Pernambuco and Watling and Meijer (1997) for Paraná. The basidiospore ornamentation observed in SEM (Fig. 3), is similar to that presented by Watling and Meijer (1997).

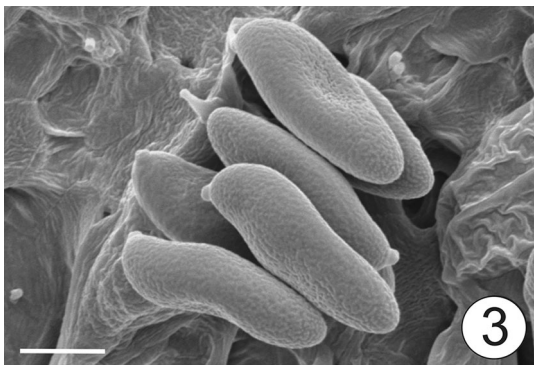

Fig. 3 Basidiospores in SEM of *A. festivus* (*Bar* 5 µm)

Fulgenzi et al. (2010) reported *A. festivus* from Guyana, but the spores in the Guyana specimen have a reticulated ornamentation with more pronounced anastomosing ridges when the SEM images are compared with the Brazilian specimens. The Guyana specimens have hyaline pleurocystidia when mounted in water, while in the Brazilian specimens they are golden yellow. These differences may indicate a larger variability in the spores and cystidia within the species, or a variation related to the geographic distance between these two populations of *A. festivus* (Watling and Meijer 1997; Fulgenzi et al. 2010).

The specimens collected in Santa Catarina presented terminal hyphae of the pileipellis that are granularly encrusted, a characteristic observed in the description of the type material from Pernambuco (Singer 1970). Watling and Meijer (1997), in the description of the Paraná specimen, affirm that the pileipellis hyphae are non-encrusted. Fulgenzi et al. (2010) did not comment about the encrustation on the pileipellis from the Guyana specimens, but described the presence of scattered, external orange-red crystal on the stipe trama.

Acknowledgments The first author thanks Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) for financial support during the development of this study. Ariadne Nóbrega Marinho Furtado, Cauê Azevedo Tomaz Oliveira, and Celeste Heisecke Cabrera helped during field collections. We would like to thank Laboratório Central de Microscopia Eletrônica—Universidade Federal de Santa Catarina for the SEM analyses. Nathan Smith made valuable suggestions in the manuscript.

References

Fulgenzi TD, Halling RE, Henkel TW (2010) *Fistulinella cinereoalba* sp. nov. and new distribution records for *Austroboletus* from Guyana. Mycologia 102(1):224–232

Halling RE, Osmundson TW, Neves MA (2006) *Austroboletus mutabilis* sp. nov. from northern Queensland. Muelleria 24:31–36

Kirk PM, Cannon PF, Minter DW, Stalpers JA (2008) Ainsworth and Bisby's dictionary of the fungi, 10th edn. CAB International University Press, Cambridge

Kramer LA (2004) The online auction color chart. Online Auction Color Chart Company, Stanford

Largent DL (1986) How to identify mushrooms to genus I: macroscopic features. I, 2nd edn. Mad River Press Inc., Eureka, p 166

Largent DL, Johnson D, Watling R (1977) How to identify mushrooms to genus III: microscopic features, 3rd edn. Mad River Press Inc., Eureka

Singer R (1961) Fungi of Northern Brazil. Publicações do Instituto de Micologia da Universidade do Recife 304:3–26

Singer R (1970) Strobilomycetaceae (Basidiomycetes). In: Flora Neotropica, Monograph 5

Singer R (1986) The agaricales in modern taxonomy, 4th edn. Koeltz scientific books, Königstein

Singer R, Araújo I, Ivory MH (1983) Ectotrophically mycorrizal fungi of the Neotropical Lowlands, especially Central Amazonia, 77th edn. Beihefte zur Nova Hedwigia

Singer R, García J, Gómez LD (1991) The Boletineae of Mexico and Central America. III. Beihefte zur Nova Hedwigia 102:1–99

Thiers B [continuously updated]. Index Herbariorum: a global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium. http://sweetgum.nybg.org/ih/. Accessed July 8 2013

Watling R, Meijer A (1997) Macromycetes from the state of Paraná, Brazil. Edinburgh Journal of Botany 54(2):243

Wolfe CB (1979) *Austroboletus* and *Tylopilus* subgenus *Porphyrellus* with emphasis on North American taxa. J. Cramer, Germany, p 148