

Two noteworthy *Phallus* from southern Brazil

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Abstract During a survey of gasteroid fungi from the state of Rio Grande do Sul, in southern Brazil, two noteworthy species of the genus *Phallus* were identified: *P. duplicatus* (new record from Brazil) and *P. granuloso-denticulatus*. The latter is a poorly known species described by Braun in 1932 that was recently recollected, and its taxonomy is discussed based on the examination of fresh and type specimens.

Keywords Gasteromycetes · Neotropical fungi · Phalloids · Phallales · Phallomycetidae

Phallaceae Corda (Basidiomycota) comprises gasteroid fungi that have basidiomata with a phallic shape, and gelatinous gleba which usually spread an unpleasant smell of rotten meat that attracts insects for basidiospore dispersal. Phalloids (or “stinkhorns,” as they are called) are currently classified in Phallales E. Fisch., subclass Phallomycetidae K. Hosaka et al. (Hosaka et al. 2006). In Brazil, the following genera are known to occur: *Phallus* Junius ex L. (= *Aporophallus* Möller, *Dictyophora*

Desv., *Itajahya* Möller, *Ityphallus* Fr.), *Mutinus* Fr., and *Staheliomyces* E. Fisch. (Baseia et al. 2006).

Southern Brazilian phalloids were studied by Möller (1895); Braun (1932) and Rick (1961). Some species were also reported in macrofungi surveys (Guerrero and Homrich 1999; Meijer 2006; Cortez et al. 2008) and broader revisions of phalloids (Lloyd 1909; Wright 1949, 1960; Dring 1980). Recently, Trierveiler-Pereira et al. (2009) emended the description of *Phallus glutinolens* (Möller) Kuntze, known only from southern Brazil and Argentina, and provided a key for seven Brazilian *Phallus*. In addition, new species (Baseia et al. 2003; Baseia and Calonge 2005) and records (Leite et al. 2007; Ottoni et al. 2010) from northeastern Brazil have increased the knowledge of this group of fungi.

In the present paper, we discuss the record of two noteworthy members of the genus *Phallus*, collected during a survey of the gasteroid fungi from Rio Grande do Sul State, in southern Brazil (Cortez et al. 2008, 2009, 2011a, b). Specimens collected by the authors are kept at the ICN herbarium (Universidade Federal do Rio Grande do Sul, Instituto de Biociências) and specimens from the PACA herbarium (*Fungi Rickiani*) were checked. Colors are from Kernerup and Wanscher (1978).

Phallus duplicatus Bosc, Mag. Ges. Naturf. Fr. Berl. 5: 86, 1811. Fig. 1a

≡ *Dictyophora duplicata* (Bosc) E. Fisch. in Sacc., Syll. Fung. 7: 6, 1888.

Eggs not seen. Basidioma up to 60 mm high when expanded. Receptacle 18 × 25 mm, campanulate, surface strongly rugose, color olive (3F8) due to the presence of gleba, apex covered with remnants of the peridium, perforated, margin appendiculate with a thin and yellowish-white (3A2) indusium, about 16 mm in length. Pseudostipe

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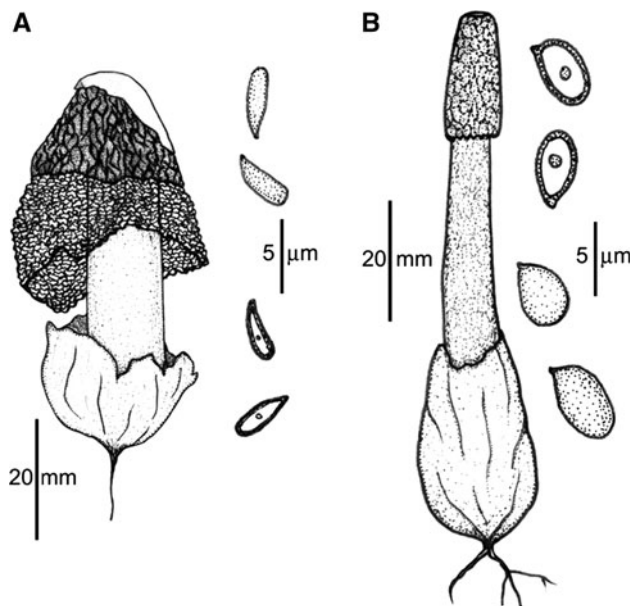


Fig. 1 Basidiomata and basidiospores of Phallaceae. **a** *Phallus duplicatus* **b** *P. granulosedenticulatus*

up to 54×13 mm, cylindrical, white (3A1), surface spongy, hollow; base with a saccate volva, 22×26 mm, color reddish white (11A2) to pale red (11A3), with a few basal rhizomorphs attached to the soil. Gleba olive (3F8), slimy, fetid. Basidiospores $3.5\text{--}4.2 \times 1\text{--}1.5$ μm , cylindrical, hyaline, smooth and thin-walled.

Examined materials Brazil, Rio Grande do Sul State, Porto Alegre, UFRGS, solitary on soil among grasses, 5 February 2009, leg. M.A. Sulzbacher & V.G. Cortez 003/09 (ICN); São Leopoldo, 25 February 1932, leg. B. Braun (PACA 15049, 15052).

Remarks The fungus is similar to *P. indusiatus* Vent., but differs in the shorter and less developed indusium, in contrast to the large indusium of *P. indusiatus*, which also presents broader basidiospores (Guzmán et al. 1990; Calonge 2005). *Phallus duplicatus* is a new record from Brazil and probably South America.

Phallus granulosedenticulatus B. Braun, Relat. Gin. Anch. 1932: 12, 1932. Figs. 1b, 2

Eggs subglobose to ovoid, $30\text{--}34 \times 20\text{--}28$ μm , grayish yellow (4B3) to grayish orange (5B4). Basidiomata 90 mm high when expanded. Receptacle 20×10 mm, campanulate, surface granular to slightly rugulose, color grayish green (28C4), deep green (29E8) to dark green (29F8), apex perforated, margin cogged to uneven. Pseudostipe 70×9 mm, subcylindrical, white (28A1) to greenish white (28A2), surface spongy, hollow; base with a saccate volva, 36×18 mm, grayish orange (5B4), bearing abundant rhizomorphs attached to the soil. Gleba deep green



Fig. 2 *Phallus granulosedenticulatus*. Photo: J. M. Oliveira

(29E8), slimy, fetid. Basidiospores $3.8\text{--}5 \times 2\text{--}3$ μm , ellipsoid, hyaline, smooth and with slightly thickened walls, guttulate.

Examined specimens Brazil, Rio Grande do Sul State, Santa Maria, UFSM, in meadow, 16 June 2008, leg. V.G. Cortez 117/08 (ICN). São Leopoldo, 1929–1932, leg. B. Braun (PACA 15042, 15043, 15044, 15046, 15047-holotype, 15048, 15050, 15051).

Remarks This species was described by Braun (1932) in a local journal, and it was later included in the posthumous checklist of Rick's gasteromycetes (Rick 1961). Nevertheless, the species remained unknown to most mycologists who revised South American phalloids, and its name was forgotten. In his obscure paper, Braun (1932) described and discussed in detail the new species, and provided an excellent description and photos that allowed its easy recognition. Since the original description, no other collections of this fungus were reported. The main features of the species are the granular to rugulose surface of the fertile portion of the receptacle, white pseudostipe and campanulate receptacle with a conspicuously cogged margin (Braun 1932). This species is macroscopically similar to the North American *P. ravenelii* Berk. & M.A. Curtis, but the latter has larger basidiomata, a smooth and well-defined pileus margin, and cylindrical basidiospores ($1\text{--}1.5$ μm width, Smith 1951). Some collections (PACA 15042, 15043, 15044, 15046) were identified by Braun himself as *P. ravenelii* before the formal description of

P. granulodenticulatus. With the re-examination of Braun's authentic materials and an additional collection, we consider it a good *Phallus* species.

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