

OUDEMANSIELLA STEFFENII: AN INTERESTING TAXON FROM BRAZIL

Abstract

The macro- and microscopical features of a Brazilian collection of *Oudemansiella steffenii* are reported. Photographs of basidiomes, some microscopic structures and a black and white plate are provided. The authors make several taxonomic considerations and illustrate its distribution over Central and South America. A comparison with allied entities belonging to the same section *Dactylosporina*, i.e. *O. cephalocystidiata*, *O. glutinosa*, *O. macracantha* and other sections conclude the work.

Riassunto

Vengono riportate le caratteristiche macro- e microscopiche di una collezione brasiliana di *Oudemansiella steffenii*, nonché presentati alcuni fotocolori dei basidiomi, di alcuni elementi microscopici e una tavola in bianco e nero. Sono effettuate considerazioni tassonomiche e fornite informazioni sulla distribuzione della specie nell'America centrale e meridionale. Confrontazioni con taxa simili appartenenti alla medesima sezione *Dactylosporina*, quali *O. cephalocystidiata*, *O. glutinosa*, *O. macracantha* e altre sezioni concludono il lavoro.

Key words: Agaricales, Physalacriaceae, *Oudemansiella*, *O. steffenii*, Neotropics, taxonomy.

Introduction

During a recent journey in Brazil one of the authors (P.P.) picked up an interesting species belonging to the genus *Oudemansiella*. Hereby we report on it in order to spread the knowledge of such an entity and similar ones to people and mycologists who are not familiar with them.

Materials and Methods

Colour photographs of the basidiome (Fig. 1) were taken in the field by a Nikon D40 digital camera. The description of macroscopic features derived from the observation of fresh specimens, while the microscopic analysis was made on fragments of dried material previously hydrated by distilled water and stained by Congo red or Floxine. We calculated the gracility index (IG) of our specimen according to HEINEMANN (1983). $IG = St^2 \times (D \times d)^{-1}$ where IG = index of gracility, St = stipe length, D = diameter of pileus, d = diameter of stipe. Technical terms used for the morphological description refer to VELLINGA (1998). Authors of fungal names were quoted in accordance with the indications of www.indexfungorum.org/Names/AuthorsOfFungalNames.asp and www.mycobank.org. The exsiccata were deposited in the authors' herbaria.

TAXONOMY

Oudemansiella steffenii (Rick) Singer, Lilloa 26: 66 (1954)

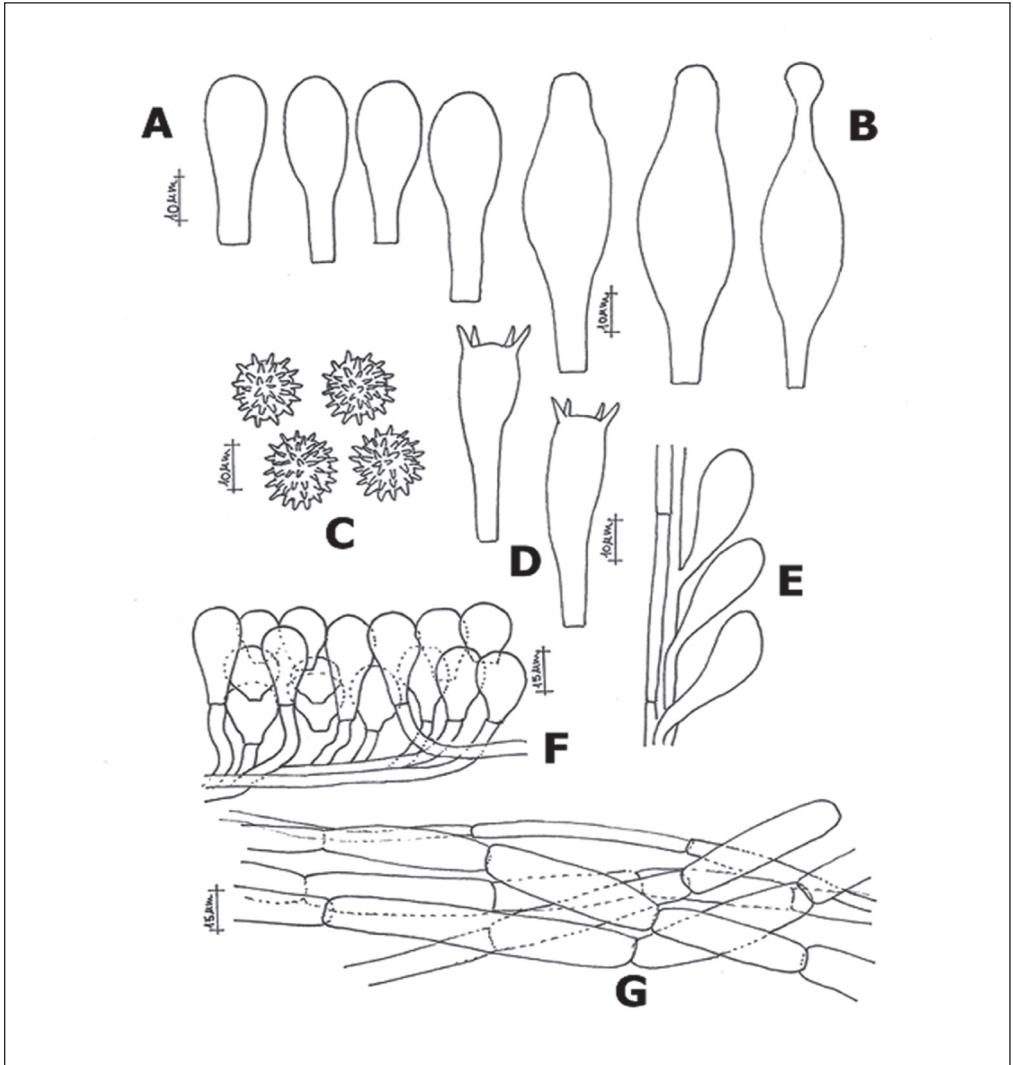
Basionym: *Tricholoma steffenii* Rick, *Brotéria Série Botânica* 24: 99 (1930).

Homotypic synonyms:

≡ *Dactylosporina steffenii* (Rick) Dörfelt, *Feddes Repertorium Specierum Novarum Regni Vegetabilis* 96: 237 (1985);

≡ *Xerula steffenii* (Rick) Boekhout & Bas, *Persoonia* 13 (1): 55 (1986).

Pileus 50 mm broad, appanate with a low umbo; margin slightly inflexed, strongly translucently striate. Surface rugose at centre, smooth elsewhere, almost viscid, soon dry, yellow-brown at centre, whitish or greyish at margin.



Oudemansiella steffenii. Microscopic table. A. Basidioles; B. Pleurocystidia; C. Spores; D. Basidia; E. Caulocystidia; F. Pileipellis; G. Hymenophoral trama. Drawing by Paolo Picciola

Lamellae adnexed to emarginate, moderately distant, ventricose, up to 6 mm broad, white, with numerous lamellulae of different length; edge concolorous, entire or almost so.

Stipe 150 × 7 mm, cylindrical, slender, thin, with rooting base, fistulose, lacking a ring; surface dry, pure white, fibrillose, pruinose at apex.

Context white. Odour none, taste mild.

Spore print not recorded.

Spores (9)11-14(15) × (7)9-10(13) μm (without spines); Q = 1.0-1.2, mainly globose, but also subglobose, hyaline, inamyloid, thin walled, echinate. Spines 2.0-3.5 μm long having a rounded apex.

Basidia 36-60 × 12-19(22) μm, clavate, hyaline, 2 and 4-spored.

Cheilocystidia not observed.

Pleurocystidia 90-120 × 25-27 μm, fusiform to lageniform with obtuse to subcapitate apex, scattered, hyaline.

Caulocystidia 55-90 × 17-22 μm, clavate, scattered, hyaline.

Hymenophoral trama (sub)regular, made up of septate and hyaline cylindrical hyphae 2-20 μm wide and up to 120 μm long. There are sporadic clamp-connections.

Pileipellis a hymeniderm of clavate, pyriform, spheropedunculate cells 18-60 × 14-23 μm, thin-walled which originate from a layer of hyphae 4-8 μm wide.

Stipitipellis a cutis of parallel, cylindrical hyphae 7-19 μm wide. Clamp-connections not observed.

Clamp-connections scattered.

Ecology in a forest of *Araucaria angustifolia* (Bertol.) Kuntze (980 m elevation), on the ground among buried woody debris.

Phenology 9 Jan 2014.

Material examined Brazil, Paraná, Curitiba, Campina Grande do Sul, *leg. et det.* P. Picciola.

Discussion

With regard to the taxonomy of xeruloid/oudemansielloid taxa PETERSEN & HUGHES (2010) recognised eight genera based on morphological and molecular data, viz. *Dactylosporina* (Cléménçon) Dörfelt, *Hymenopellis* R.H. Petersen, *Mucidula* Pat., *Oudemansiella* Speg., *Paraxerula* R.H. Petersen, *Ponticulomyces* R.H. Petersen, *Protoxerula* R.H. Petersen e *Xerula* Maire, while YANG ET AL. (2009) took into account only three genera, i.e. *Xerula* s. str., *Oudemansiella* and another undefined genus.

In her review of the Petersen & Hughes' monograph, VELLINGA (2010) stated that "recognition of non-monophyletic genera is very problematic" and "the solution might be to recognize three genera": *Xerula* ss. str., *Oudemansiella* and *Paraxerula*, sharing substantially the Chinese authors' point of view. Within the genus *Oudemansiella* YANG ET AL. (2009) placed the species with echinulate spores, like *O. steffanii* (Rick) Singer, into the section *Dactylosporina* which CLÉMENÇON (1979) instead had considered as a subgenus. Nowadays the aforementioned section encompasses four entities: *O. cephalocystidiata* (R.H. Petersen & Aime) Wartchow described from Guyana, *O. glutinosa* Singer found in Colombia, Ecuador and Guyana, *O. macracantha* Singer reported from Argentina, Bolivia Brazil, Colombia, Mexico, Panama and Venezuela and *O. steffanii* picked up in Argentina, Bolivia, Brazil, Costa Rica and French Guyana.

O. macracantha is the closest species and according to SINGER (1964) it differs from *O. steffanii* in having a very small pileus (up to 15 mm broad), different colours (deep brown), hymenial cystidia with different shape, larger spores (13.7-15.2 × 13.5-13.8 μm vs 10-14 × 9-13 μm) and longer spines (3.5-5.5 μm vs 1.4-3.5 μm) of the spores. A particularly interesting feature is the gracility index (IG), a biometric index introduced by HEINEMAN (1093) while studying the genus *Micropsalliota* Höhn, whose meaning was explained in the section Materials and Methods of this paper.

WARTCHOW ET AL. (2014) by comparing slender basidiomes of both taxa (*O. steffanii* and *O. macracantha*) noted that the IG of *O. macracantha* (350) was much greater than the one of *O. steffanii* (140). The IG of our specimen is 64, closer to the typical values of *O. steffanii*. The slenderness of the basidiomes of *O. steffanii* and *O. macracantha* is widely accepted for species segregation (SINGER, 1964; PETERSEN & HUGHES, 2010; WARTCHOW ET AL., 2010). Controversial is instead the case of the number of spines of the spores. In the protologue of *O. macracantha* SINGER (1962) used only the length of spines for differentiating this taxon from *O. steffanii*. Later SINGER (1964) also included the number of spines and slenderness of stipe as important features useful for separating such close species reporting the presence of 38-42 spines per



Figure 1. *Oudemansiella steffanii*

Photo by Paolo Picciola

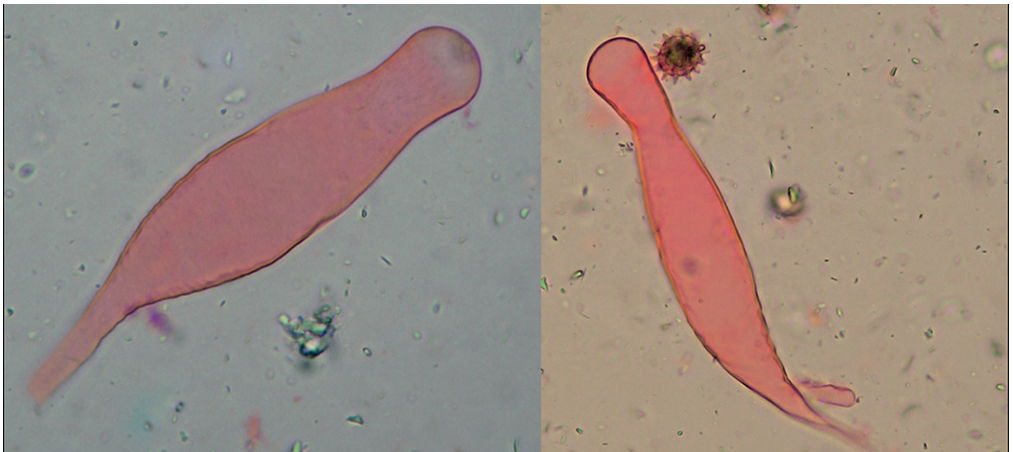


Figure 2. *O. steffanii*. Hymenial cystidia and one spore.

Photo by Eliseo Battistin

basidiospore; almost identical data are presented by WARTCHOW *ET AL.* (2010) who described basidiospores of *O. steffanii* having more than 30 spines.

On the contrary PETERSEN (2008) affirmed that basidiospore spines in *O. macracantha* were more numerous and longer than those of *O. steffanii*. Regarding this issue it is worth reporting that WARTCHOW *ET AL.* think that the images provided by PETERSEN (2008) probably correspond to *O. steffanii* due to the relatively shorter basidiospore spines depicted compared to the type specimen. In our opinion a detailed statistical survey on the number of spines per basidiospore photographed by SEM should be done in order to solve the above mentioned question,

also because counting spines by the light microscope is not very easy and can be imprecise. As far as we are concerned we measured many spines and found that their size ranges from 2 to 3,5 µm, values which match those of *O. steffanii*. PETERSEN (2008) also reported an additional feature that perhaps could help segregate the echinulate spored *Oudemansiella*: in *O. macracantha* the spines remain turgid in spite of the vacuum applied by electron microscope, while in *O. steffanii* they are partially collapsed after SEM preparation.

Regarding the caulocystidia SINGER (1964) reported on the existence of specimens with pure white or white and umber stipes, so hyaline or fuscous caulocystidia can be observed. *O. cephalocystidiata* is distinguished from *O. steffanii* especially on account of the presence of capitate caulocystidia and smaller spores provided with a lesser number of spines.

In comparison with *O. steffanii*, *O. glutinosa* possesses smaller basidiospores, gelatinized zones in the pileus and stipe and cylindrical to vermiform caulocystidia. Other temperate or tropical *Oudemansiella*, like *O. canarii* (Jungb.) Höhn., *O. radicata* (Rehhan) Singer and *O. subnigra* Singer have been recorded in Brazil; misidentifications with *O. steffanii* are impossible especially because all of them have smooth spores.

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