

GEASTRUM TRICHIFERUM AND *GEASTRUM SETIFERUM* (GEASTRALES, PHALLOMYCETIDAE) NEW RECORDS FOR ARGENTINA

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Summary: In the present study two new records of *Geastrum* are reported for Argentina: *G. trichiferum* Rick and *G. setiferum* Baseia. Descriptions, comments and illustrations of basidiomata are given.

Key words: Fungal morphology, Gasteromycetes, mycobiota, rain forest, taxonomy.

Resumen: *Geastrum trichiferum* y *Geastrum setiferum* (Geastrales, Phallomycetidae) nuevas citas para Argentina. En el presente estudio se reportan dos nuevas citas de *Geastrum* para Argentina: *G. trichiferum* Rick y *G. setiferum* Baseia. Se adjuntan descripciones, comentarios e ilustraciones de los basidiomas.

Palabras clave: Gasteromycetes, micobiota, morfología de hongos, selva, taxonomía.

INTRODUCTION

The genus *Geastrum* (Geastrales, Phallomycetidae), first established by Persoon in 1801, is characterized by a mass of fertile tissue emerging of the central axis (collumella) enclosed in a spherically shaped fruit body by two complex layers, the outermost (exoperidium) splitting at maturity into rays, which gives to the fruit body the characteristic form of a star. The innermost wall remains unbroken and the spore liberation takes place through a single apical pore surrounded by a highly variable structure, the peristome. The actual status of our knowledge of the occurrence of this genus in Argentina is limited to the province of Buenos Aires (Soto & Wright, 2000; Wright & Albertó, 2002), central region of the country (Dominguez de Toledo, 1986, 1989), Misiones (Wright & Wright 2005) and few articles about collections from the rest of the national territory (Spegazzini, 1912, 1927; Dios *et al.*, 2000, 2011; Kuhar & Papinutti, 2009).

The present work describes and illustrates two

Geastrum species not previously reported, in order to contribute to the knowledge of the Argentinean gasteroid mycobiota.

MATERIALS AND METHODS

Specimens were collected in rain forest areas from Puerto Iguazú, Province of Misiones and Colón, Province of Entre Ríos. Macro and microscopic characters were described according to Sunhede (1989). Hyphae from different tissues, capillitial threads and spores were mounted and observed under the light microscope (LM) and scanning electron microscope (Zeiss DSM 982 GEMINI secondary electrons detector in-lens). In presenting the size range of microscopic and macroscopic elements, at least 15 measurements were made and mean values calculated. All LM photographs were taken from phloxine-stained slides. Specimens were dried, kept frozen for a week and deposited in Buenos Aires Fungal Collection Herbarium.

RESULTS

Geastrum trichiferum Rick, in Lloyd, *Mycol. Notes* 2: 315, 1907 [as 'Geaster trichifer']. (Fig. 1)

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Lectotype: BRAZIL. J. Rick, C. G. Lloyd's Collection cat. no. 54716 (BPI 706086).

Unexpanded basidiome epigeous on litter. Growing on a loose, white and weak subiculum. Mature basidiome small-sized. Width of the dry full expanded basidiome 5–10(–12) × 4–5 mm (Fig. 1A). Exoperidium saccate, splitting to about the middle into 5–8 non-hygroscopic rays. Mycelial layer yellowish brown, not encrusting debris, densely hirsute, hairy elements up to 0.8 mm. Fibrous layer whitish, papery. Pseudoparenchymatous layer dark brown, peeling off in old specimens. Endoperidial body sessile, 3–4 mm diam, smooth, globose, sometimes broadly ovate, old specimens may lose the endoperidial body. Apophysis absent. Pseudostipe lacking. Peristome fibrillose, conical, concolorous with the surrounding endoperidium or slightly different darker or lighter (especificar), delimited or not by a depression. Spores ± globose, (3.8–) 4.3–5. µm diam with up to 0.3 µm high columnar processes with planar tips, usually ornamentations are confluent (Fig. 1B). Capillitial hyphae thick-walled, yellowish to brownish, 3–7 µm diam.

Habit and habitat. Gregarious on litter under grass.

Comments. This species is characterized by a mycelia layer with golden yellow hairs of up to 0.8 mm high. *Gaestrum trichiferum* was described

growing on wood (Baseia & Calonge, 2006; Trierveiler Pereira *et al.* 2011), but the collection herein reported was observed on litter. *Gaestrum schweinitzii* (Berk. & M.A. Curtis) Zeller and *G. trichiferum* have many characteristics in common e.g. small, saccate, basidiomata arising in clusters from subiculose mycelium, endoperidial body sessile and peristome fibrillose and delimited. However the presence of the hairy mycelial layer in *G. trichiferum* is a striking difference with *G. schweinitzii*. This is the first record for subtropical forests from Argentina.

Specimens examined. ARGENTINA. Prov. Misiones, Puerto Iguazú, Parque Nacional Iguazú, Palmital “El Cruce”, 25°41'24.4" S, 54°48'43.2" W, Andrea Romero, V-2008, Romero 52281 (BAFC).

Gaestrum setiferum Baseia, *Mycotaxon* 84: 136. 2002. Holotypus: BRAZIL, Sao Paulo, Ecological Station of Jatai, 17/1/2002, leg. Baseia 1450, in Herb. SP n° 307595 conservatus est.; isotypus in Herb. URM n° 77072; paratypus: in Herb. URM n° 77077. (Fig. 2).

Unexpanded basidiomata globose, hypogeous. Mature basidioma medium-sized to large (Fig. 2A). Width of the fresh full-expanded basidiome 45–55 mm (Fig. 2D). Exoperidium strongly arched, splitting to about the middle into 6–8 non-hygroscopic rays, with tips of rays recurved under

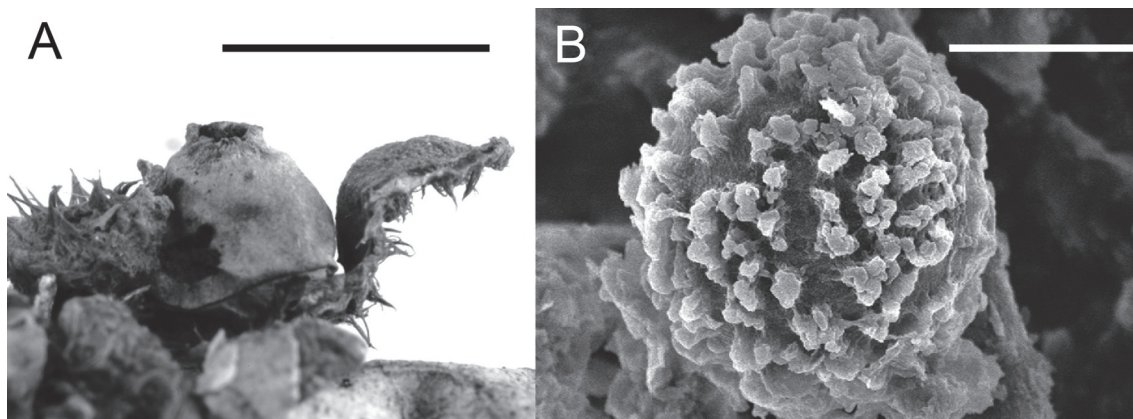


Fig. 1: *Gaestrum trichiferum*. A: Dry basidiome. B: SEM micrograph of spore. Scale bars: A = 0.5 cm. B = 2 mm.

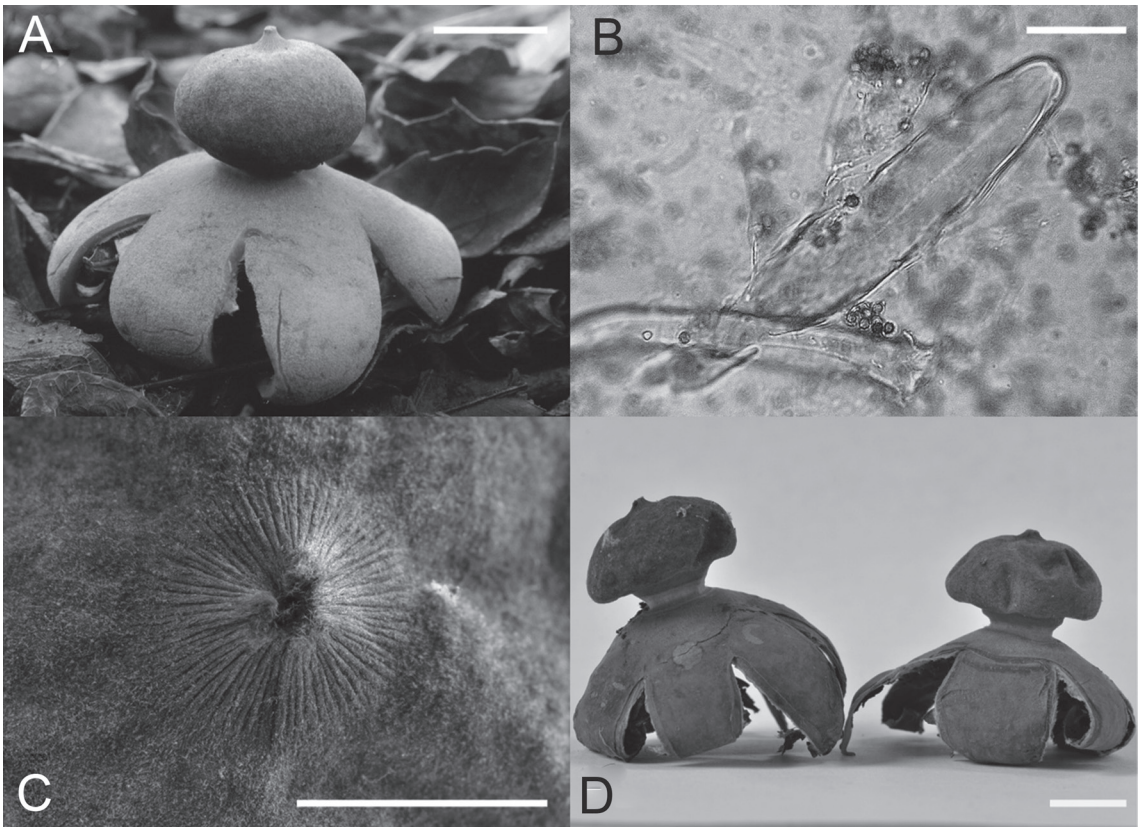


Fig. 2: *Geastrum setiferum*. **A:** Fresh mature basidiome. **B:** micrograph of setae. **C:** Peristome. **D:** Dry basidiomata. Scale bar: A and D = 1 cm. B = 10 μ m. C = 2 mm.

the exoperidial disc. Mycelial layer whitish, with debris incrustated, flaking off the fibrous layer in old specimens. Fibrous layer whitish, coriaceous. Pseudoparenchymatous layer beige, turning brown in age, persistent. Endoperidial body beige when fresh, brown in old specimen, pseudostipitate, 15–20 mm diam, depressed globose, setose. Setae 95–110 \times (20–) 30 μ m (Fig. 2B). Apophysis absent. Pseudostipe 2 mm high, stout, flattened in cross-section 4–5 \times 7 mm. Peristome conical to mammiform, truncated at the apex, finely plicate, not delimited (Fig. 2C). Mature gleba brown. Spores globose, 3–4 μ m diam, with columnar ornamentation. Capillitial hyphae 2.5–7 μ m wide, brown, thick-walled \pm smooth or slightly incrustated with debris, lumen visible as a line, straight.

Habit and habitat. Gregarious on organic soil with abundant fallen leaves.

Comments. Specimens from Brazil were described as saccate, sessile and having a definite peristome (Baseia & Milanez, 2002). Trierveiler Pereira *et al.* (2011) describes an exoperidium appanate to slightly arched, a short stipe 1.5 mm high and a weakly delimited peristome by contrast the Argentinean collections exhibited strongly arched basidiomata, along with an endoperidial body possessing an evident whitish pseudostipe and not delimited peristome. *Geastrum setiferum* and *G. smardae* Stanek resemble each other in having strongly arched basidiomata, thick and whitish pseudostipe contrasting with both the colour of endoperidial body and pseudoparenchymatous layer. Besides they are of similar size and have the same number of rays. There are, however, differences in several characteristics. *Geastrum smardae* has a fibrillose peristome, a prominent apophysis and a mycelial layer persistent or it loose

forming a deep bowl while in *G. setiferum* the peristome is finely plicate, the apophysis is absent and its mycelial layer peels off as flakes. However, the more remarkable difference is the presence of setae in the endoperidial body of *G. setiferum*. The size of the setae in argentine collections is similar to brazilian collections (Baseia & Milanez 2002) but differ from those described by Trierveiler-Pereira *et al.* (2011). We therefore suggest that this character is variable within the species. This is the first report of *Geastrum setiferum* for Argentina.

Both species here described were found in Argentina and Brazil in similar environments, in rain forested areas.

Specimens examined. ARGENTINA. Prov. Entre Ríos, Dpto Colon. Colón, Leandro Papinutti, Guillermo Rolon 32°10'01.75''S 58°11'04.72''W, 27-XI-2009, Rolón & Papinutti 52282 (BAFC).

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