

New record of *Comatricha alta* Preuss (Stemonitaceae, Stemonitales) from Brazil

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Abstract: *Comatricha alta* was found in samples from a Cerrado ecosystem located in the State of Goiás, Brazil. This record was obtained as part of the study of the myxobiota from Chapada dos Veadeiros. Although it is known on five continents, until now its distribution in the Neotropics was restricted to Chile and Peru, this being the first finding for Brazil and the third record for the Neotropical region.

Keywords: Cerrado, myxomycetes, new occurrence, South America.

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The genus *Comatricha* (Amaurochaetaceae, Stemonitales) was established by Preuss in 1851, and currently encompasses 41 species. It is characterized by having stalked sporophores, fibrous stalk at the base, globose or cylindrical sporotheca, capillitium forming a network of thin, dark and branched threads, appearing along the columella, generally without sharp free ends, with dark and globose spores (Goodwin 1961; Castillo et al. 2005; Zhang et al. 2018).

Comatricha alta Preuss was initially treated as a variety of *Comatricha nigra* Pers. because it displays some very similar macroscopic characters, however, Krzemieniewska (1960) and Nannenga-Bremekamp (1974) considered it as an independent taxon from the first species of *Comatricha* classified by Preusz. Therefore, since then they have been treated and recognized in the literature as independent species.

These two species differ mainly because of its capillitium, which is released when the peridium breaks open, which does not occur in *C. nigra*, giving it an intact sporotheca for a longer period. Other factors are the shape of the sporotheca and the total size of the sporangium: *C. nigra* has a globose sporotheca and sporangium 1.5–2 mm high, while *C. alta* has an oval sporotheca and sporangium 3–7 mm high (Harkonen 1979; Haan 1994).

Comatricha alta is a cosmopolitan species, with a wide distribution across the globe. Most records are from Europe (Spain, Germany, England, Poland, Switzerland, Holland, Finland) (GBIF 2022). It also has occurrences in Oceania (New Zealand, Australia) (Gracia et al. 1983); Asia (Japan, Vietnam) (Martin

and Alexopoulos 1969, Tran 2014); Africa (South Africa) (Ndiritu et al. 2009); North America (USA) (GBIF 2022) and South America (Chile, Peru) (Lado et al. 2013; Zevallos and Lado 2020).

However, during a recent study of the myxobiota of Central Brazil, sporocarps of this species were found in samples of the cortex of trees incubated in moist chambers. This sample is from the Chapada dos Veadeiros region, an important remnant of the Cerrado Biome (Brazilian Savanna) in the domains of the Historic and Cultural Heritage Site of the Kalunga Quilombola Community, at an altitude of 1700 m, in the north of Goiás State, Brazil.

The Chapada dos Veadeiros region has an altitude that varies from 300 to 1700 m and is completely covered by Cerrado vegetation, with prevalence of two phytogeographical domains (phytogeographic domains) of this Biome: cerrado *stricto sensu* and “campo limpo” (Baiocchi 1999, Ribeiro and Franco 2022). The climate in this region is Tropical highland (Köppen's Cwa), with average annual temperatures ranging from 21–22 °C and with about 1500 mm of rain per year (Ramalho et al. 2013). The samples were collected in an area of cerrado *stricto sensu*, a phytogeography characterized by vegetation with well-defined strata, presence of grasses and deciduous low-height trees, randomly distributed on the ground in different densities, without forming a cover continuous, giving the area a high solarimetric index.

The identification was made using macro and micromorphological characteristics, based on the description by Gracia et al. (1983), Poulain et al. (2011a, b) and Zevallos and Lado (2020). Color classification was based on Kernerup and Wanscher (1978). The voucher was deposited at the Fungarium of the Universidade Estadual de Goiás (HUEG-Fungi), Anápolis, Goiás, Brazil.

Comatricha alta Preuss, *Linnaea* 24:141 (1851) (Fig. 1).

Sporocarps stalked, dark brown, in clusters to semi-clusters, 2.67 mm tall. The sporotheca is oblong with an average of 0.27 X 0.47 mm, brown (5F5). Stalk is cylindrical, erect, curved at apex, always higher than the sporotheca, 2.2 mm long, 0.06 mm wide at midpoint, dark brown (6F4), fistulous, composed of reddish-brown (8E6) or olive brown (4E5) fibers visible at the base. Peridium not observed. Columella dark brown (6F4), densely branched, reaching the upper end of the sporangium, tapered, as an extension of the stalk. Mesh capillitium, light brown (6D4) 1–3 µm in diameter, evanescent. The spores en masse are dark brown (6F4), when viewed in reflected light microscopy they are yellowish brown (5D5), verrucose, 8–10 µm in diameter.

Material analyzed: Brazil, Goiás: Chapada dos Veadeiros, Kalunga community, 13°36'29.2"S 47°28'14.9"W, 11/VII/2022, In a moist chamber assay of the cortex of an undetermined tree species, SXS7537 (HUEG 15365).

The characteristics observed in the specimens studied here corresponded to what is found in the literature (Harkonen 1979; Gracia et al. 1983; Lado et al. 2013; Zevallos and Lado 2020), except for their overall size. These authors described a size between 3–7 mm in total height for the sporangium and we recorded an average size of 2.67 mm.

The present study contributes to expanding knowledge about the geographic distribution of this species by documenting the first record for Brazil, within the Cerrado biome, and the third in the Neotropical region. This record demonstrates the importance of protecting and studying preservation areas and forest fragments in understudied regions, such as the Brazilian Cerrado.

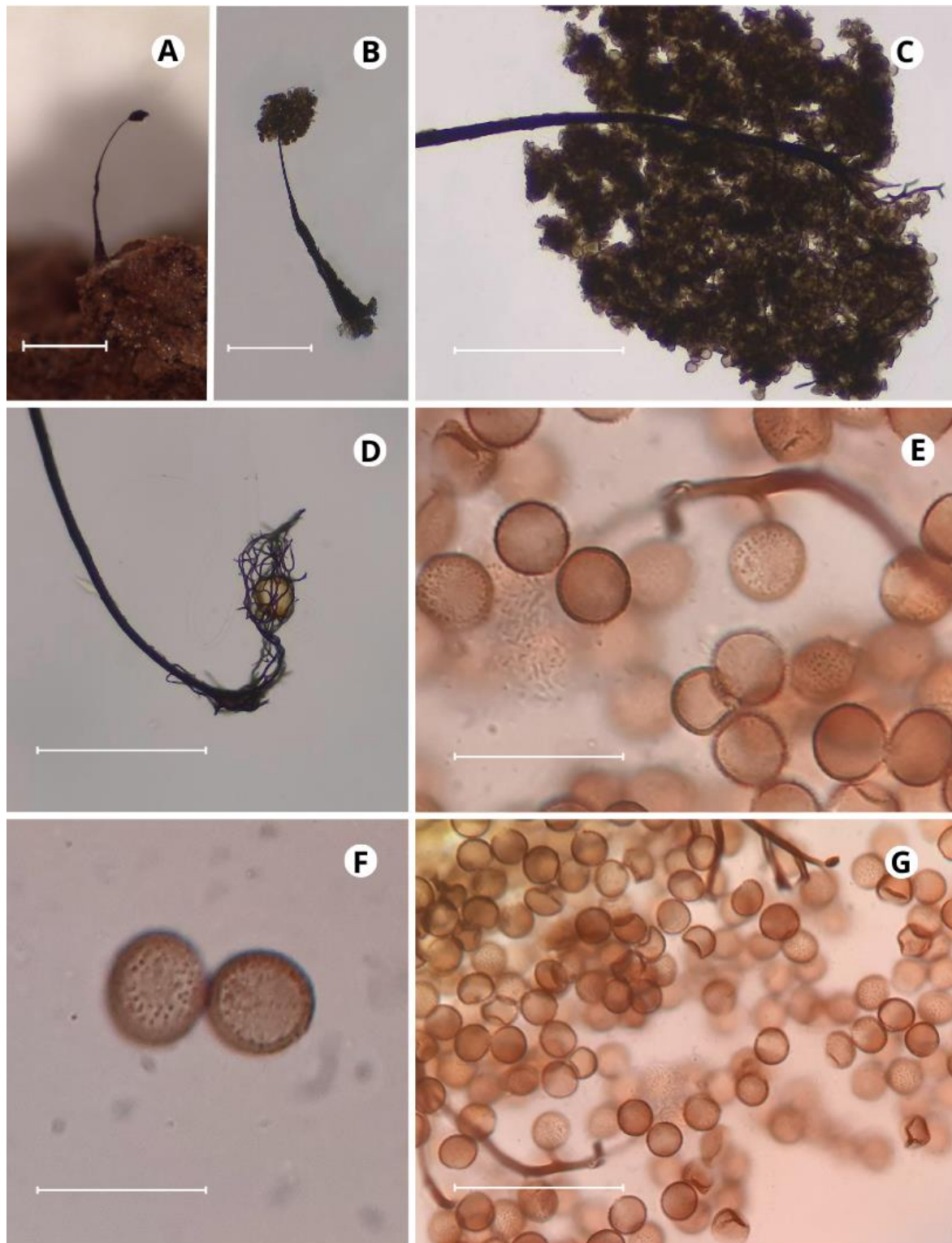


Figure 1. *Comatrixa alta* (HUEG 15365). **A)** Sporangium viewed through the stereoscope (bar 1 mm), **B)** Sporangium seen by reflected light microscope (bar 0.6 mm), **C)** Sporotheca (bar 0.3 mm), **D)** sporotheca with almost no spores, showing the capillitium and columella (bar 0.5 mm), **E)** Spore and capillitium (bar 20 μ m), **F)** Spore detail (bar 10 μ m), **G)** Spore mass (bar 40 μ m).

References

- Baiocchi MN. 1999. Kalunga: Povo da Terra. Brasília, Brasil: Ministério da Justiça. 123 p.
- Castillo A, Moreno G, Illana C, Sanchez A. 2005. Two rare species recently described in the genus *Comatricha*. R Catalan Micol. 27: 153-158.
- Gracia E, Honrubia MG, Llimona X. 1983. Mixomicetes nuevos o interesantes para la flora Iberica y Balear, II. Collect Bot. 14: 275-279.
- GBIF [Internet]. 2022. Global Biodiversity Information Facility, Copenhagen: GBIF; [visited 24 Nov 2022]. Available from: <https://www.gbif.org>.
- Goodwin DC. 1961. Morphogenesis of the Sporangium of *Comatricha*. Am J Bot. 48(2): 148-154.
- Haan M. 1993. Het hoeft niet altijd *Comatricha nigra* te zijn. *Comatricha pulchella* (C.Bab.) Rost. AMK Mededelingen 93:(4) 102-104.
- Harkonen, M. 1979: Additions and corrections to the Finnish flora of Myxomycetes. Karstenia 19: 1-7.
- Kornerup A, Wanscher JH. 1978. Methuen handbook of colour, 3rd ed, London: Eyre Methuen. 32 p.
- Krzemieniewska H. 1960. Sluzowce Polski. Na tie Flory Sluzowcow Europejskich. Warsaw: Polska Akademia Nauk. Institut Botaniki. 313 p.
- Lado C, Wrigley de Basanta D, Estrada-Torres A, Stephenson S. 2013. The biodiversity of myxomycetes in central Chile. Fungal Divers. 59: 3-32.
- Martin GW, Alexopoulos CJ. 1969. The Myxomycetes. Iowa City, Iowa: University of Iowa Press. 561 p.
- Nannenga-Bremenkamp NE. 1974. De Nederlandse Myxomyceten. Netherlands: Biblioth Kon Nederl Natuurhist. 440 p.
- Ndiritu G, Winsett K, Spiegel F, Stephenson S. 2009. A checklist of African Myxomycetes. Mycotaxon 107: 353-356.
- Ramalho AC, De Paula CD, Catão-Dias JL, Vilarinho B, Brandão RA. 2013. First record of *Batrachochytrium dendrobatidis* in two endemic Cerrado hylids, *Bokermannohyla pseudopseudis* and *Bokermannohyla sapiranga*, with comments on chytridiomycosis spreading in Brazil. NW J Zool. 9: 145-150.

Ribeiro LS, Franco JLA. 2022. Das Primeiras Ocupações à Criação do Parque Nacional da Chapada dos Veadeiros. *Historia Ambiental Latinoamericana Y Caribeña (HALAC) Revista de la Solcha* 12(1): 108-136.

Tran DQ, Nguyen HTN, Tran HTM, Stephenson SL. 2014. Myxomycetes recorded from three lowland tropical forests in Vietnam. *Mycosphere* 5(5): 662-672.

Poulain M, Meyer M, Bozonnet J. 2011a. Les Myxomycètes. Guide de détermination. Tome 1. Sévriér: Fédération Mycologique et Botanique Dauphiné Savoie. 568 p.

Poulain M, Meyer M, Bozonnet J. 2011b. Les Myxomycètes. Tome 2. Sévriér: Fédération Mycologique et Botanique Dauphiné Savoie. 551 p.

Zevallos IF, Lado C. 2020. New records of Myxomycetes from Peru. *Check List* 16: 253-264.

Zhang B, Wang S, Xu X, Li T, Dai D, Li Y. 2018. Identification of the new species *Comatricha macrospora* and two other recently recorded species of *Comatricha* from China. *Phytotaxa* 374 (1): 71-79.