



## MYXOBIOTA (PROTISTA, AMOEBOZOA) FROM CENTRAL BRAZIL: NEW RECORDS OF *Trichia affinis* BARY FROM THE CERRADO

## MIXOBIOTA (PROTISTA, AMOEBOZOA) DO BRASIL CENTRAL: NOVO REGISTRO DE *Trichia affinis* BARY PARA O CERRADO

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### Abstract

This work records the first occurrences of *Trichia affinis* in the Brazilian Cerrado biome, expanding the geographic distribution of the species in the national territory. These records occurred in the Ecological Reserve of the State University of Goiás and in the Silvânia National Forest - areas of environmental preservation and scientific research, where sporocarps and plasmodium of the species were collected. To carry out a reliable identification, comparisons macro and microscopic were made between species belonging to the cryptic complex *Trichia favoginea*, which in turn includes the species *Trichia favoginea*, *Trichia persimilis* and *Trichia affinis*. These records provide an addition of species to the Cerrado biome, denoting its great biodiverse potential, furthermore, it brings important taxonomic factors to the identification process.

**Keywords:** Brazilian Savanna, Myxomycetes, New record, *Trichia affinis*.

### Resumo

Este trabalho registra as primeiras ocorrências de *Trichia affinis* no bioma Cerrado brasileiro, ampliando a distribuição geográfica da espécie no território nacional. Esses registros ocorreram na Reserva Ecológica da Universidade Estadual de Goiás e na Floresta Nacional da Silvânia - áreas de preservação ambiental e pesquisas científicas, onde foram coletados esporocarpos e plasmódios da espécie. Para realizar uma identificação confiável, foram feitas comparações macro e microscópicas entre espécies pertencentes ao complexo críptico *Trichia favoginea*, que por sua vez inclui as espécies *Trichia favoginea*, *Trichia persimilis* e *Trichia affinis*. Esses registros proporcionam um acréscimo de espécies ao bioma Cerrado, denotando seu grande potencial biodiverso, além de trazer fatores taxonômicos importantes para o processo de identificação.

**Palavras chaves:** Cerrado brasileiro, Mixomicetos, Novo registro, *Trichia affinis*

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### Introduction

The Trichiaceae (Trichiales) family comprises 12 genera and 170 species. Among these genera, *Trichia* stands out because of its wide global geographic distribution and large number of species (33 spp) (Bezerra 2010). The genus was established by Haller in 1768, being characterized by having capillitium elaters and well developed, sharing sessile or pedicellate sporophores (Liu et al. 2007).

*Trichia affinis* Bary has sessile, subglobose, yellow sporophores, with great resemblance to *T. persimilis* Kanst. and *T. favoginea* (Batsch) Pers., with *T. favoginea* being the first to be described in 1794. Therefore, Farr (1958) made these two more recent variations of *T. favoginea*, claiming to have many morphological similarities. However, more recent molecular data (Garcia-Cunchillos 2022) indicate that these three species are in fact distinct.

*Trichia affinis* has a wide global distribution, occurring on all continents, except Antarctica. However, there are few records of this species in Brazil, which are confined to areas of the Atlantic Forest, in the South, Southeast and Northeast regions (Maia 2010, CRIA 2023). However, during sampled randomly (active search) carried out in the Ecological Reserve of the State University of Goiás (REC-UEG) and in the National Forest (FLONA) of Silvânia, fructification of *T. affinis* was found in decomposing fallen trunks. This work reports the first records of *T. affinis* in the Cerrado biome and in the Midwest region.

## Material and Methods

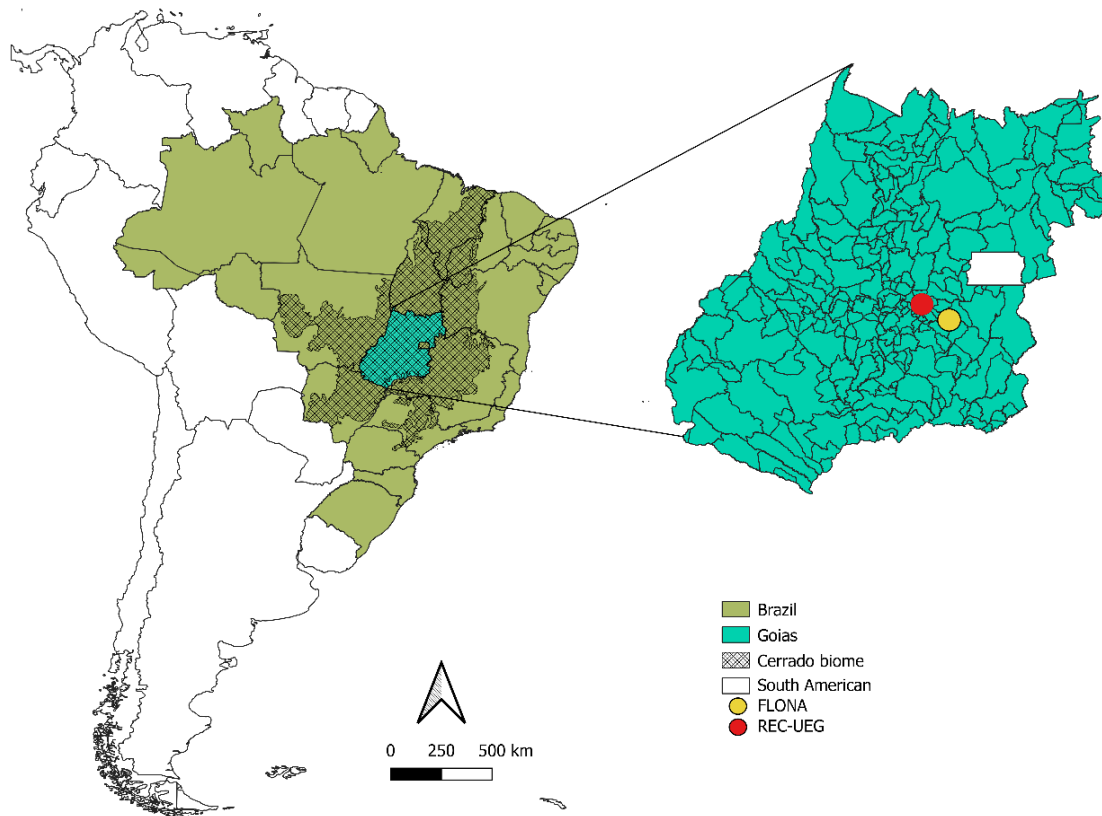
Samples of *T. affinis* were collected in the REC/UEG, in the phytophysognomy of gallery forest, and in the National Forest of Silvânia (FLONA) in mesophilic forest.

The REC/UEG, also known as “Trilha do Tatu”, is located within the facilities of the State University of Goiás Campus Central-Sede: Anápolis-CET, on the banks of Km 98 of BR 153, between parallels 16°23'40 "S and 48°57'32"W, in the municipality of Anápolis, Goiás (Figure 1). It has approximately 15 ha, cut across by the Barreiro stream, and is covered by native vegetation from the Cerrado biome. In its interior we find phytophysionic fragments characteristic of gallery forest, mesophilic forest, restricted cerrado.

FLONA, in turn, is located in the Rural Area of the municipality of Silvânia, Goiás, between parallels 16°38'29"S and 48°39'02"W (Figure 1), having an average of 486 ha, covered by Cerrado biome (ICMBio 2023), mostly covered by cerrado sensu stricto, sheltering a large mosaic of phytophysognomies (cerrado stricto sensu, gallery forest, dry forest, vereda and campo limpo) configuring characteristics of heterogeneity, denoting a great biodiverse potential. This area has the purpose of conserving native ecosystems, including environmental education and research.

The samples were herbalized and identified based on their macro and microscopic characteristics, comparing them with the relevant literature (Poulain 2011a, 2011b, Bezerra 2010 and Cavalcante 2006), in addition to comparison with a sample of *Trichia favoginea* and *Trichia persimilis* for the purpose of confirm taxonomic experience and distinguishing it from such similar species. In this sense, as distinction criteria, mainly the height of the sporocarp, diameter of the capillitium and ornamentation of the spores (bands and striations) were considered. The colors were defined using the Kornerup & Wanscher (1978) color chart. The averages of spore diameter and bands were passed through the measurement of 50 spores.

Data regarding the geographic distribution of the species were obtained from the literature, including the CRIA (2023), Flora e Funga (2023) and GBIF (2023) digital databases.



**Figure 1:** Location of REC-UEG and FLONA of Silvânia. **Distribution of *Trichia affinis* in Brazil**  
 Atlantic Forest: Northeast: Piauí (Cavalcanti 2006), Paraíba (Costa 2009), Pernambuco (Rufino 2007),  
 Sergipe (Bezerra 2010); South: Rio Grande do Sul (CRIA 2023); Southeast: São Paulo (CRIA 2023).  
 Cerrado: Midwest: Goiás (present work).

## Results and Discussion

### Material analyzed

*Trichia affinis* de Bary, in Fuckel, *Jahrb. Nassauischen Vereins Naturk.* 23-24:336 (1870).

**Brazil, Goiás:** Anápolis, REC-UEG, Lat. 016°23'14"S Lon. 48°56'34"W, 17/VII/2022, found fruited on moss, Toschi LA, 03 (HUEG 15308).

**Brazil, Goiás:** Silvânia, FLONA, Lat. 016°23'14"S Lon. 48°56'34"W, 26/IV/2023, found fruited on decaying leaf, Toschi LA, 67 (HUEG 16303).

### Characterization

White phaneroplasmodium (1A1); subglobose, sessile, densely grouped, mutual-pressure deformed, greyish-yellow (4B5) to yellow-orange (4B8), 0.2–0.7 mm diam. and 0.3–0.9 of total height; hyaline hypothalam; membranous and delicate peridium, tends to rupture at the apex after mature, pale yellow (3A3); capillitium elaters, dark yellow (4A8), apex with sharp tips, 5.2–7.1  $\mu\text{m}$  diam., ornamented with few spines; yellow spore (3A7); globose spores, 10–12  $\mu\text{m}$  diam., cross-linked by shifting bands, delicate edges, 1.1–2.4  $\mu\text{m}$ , pale yellow (4A3) under transmitted light (Figure 2).

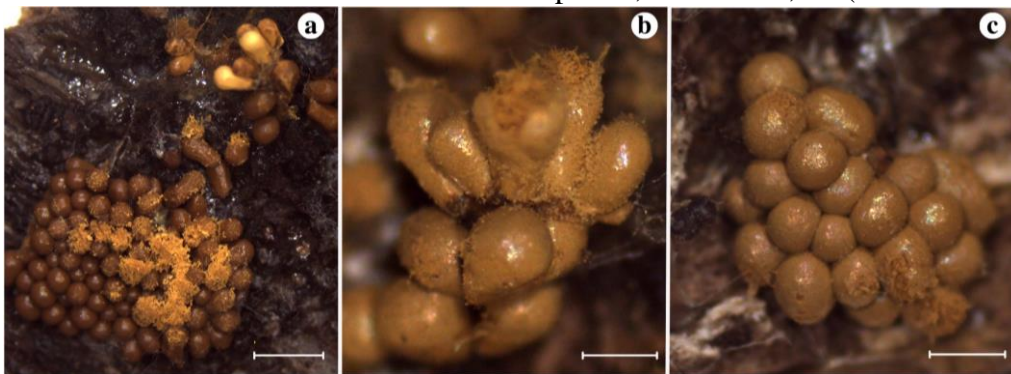


**Figure 2.** *Trichia affinis*. a- Young sporophores (3mm bar). b- Dehiscence sporophores (3mm bar). c- Intact mature sporophores (1mm bar). d- Spores showing the bands (bar 15µm). e- Spores showing the stretch marks (bar 15 µm). f- Capillitium and spores (bar 60 µm).

#### *Additional material analyzed*

*Trichia favoginea* (Batsch) Pers., Neues Mag. Bot. 1:90 (1794).

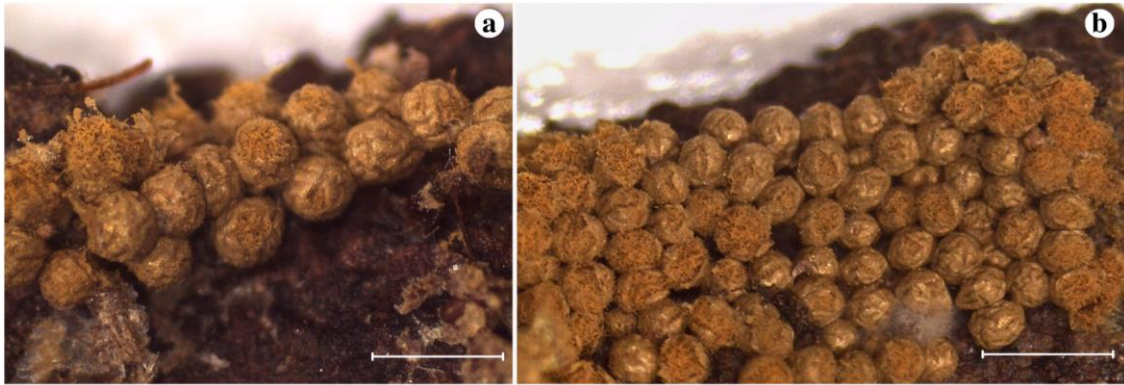
**Brazil, Goiás:** Silvânia, FLONA, Lat. 016°23'14"S Lon. 48°56'34"W, 26/IV/2023, found fruiting on decaying wood of unidentified species, Toschi LA, 56 (16304 HUEG).



**Figure 3.** *Trichia favoginea*. A-(3mm bar). b-(0.5mm bar). c-(1.5mm bar).

*Trichia persimilis* P. Karst., Not. Sällsk. Fauna Fl. Fenn. Förh 9:353 (1868)

**Brazil, Goiás:** Anápolis, REC-UEG, Lat. 016°23'14"S Lon. 48°56'34"W, 17/VII/2022, found fruiting on decaying wood of unidentified species, Toschi LA, 04 (15368 HUEG).



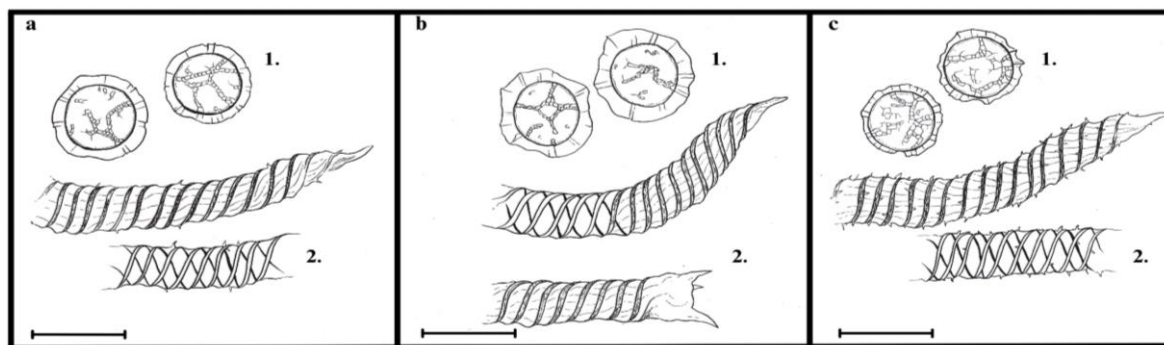
**Figure 4.** *Trichia persimilis*. a-(1mm bar). b-(bar 1.5mm)

*T. affinis* has a great morphological similarity with *T. favoginea* and *T. persimilis*, differing from them by the characteristics explained in Table 1. *T. favoginea* has higher honeycomb (Figure 3) sporophores than the others and the bands of its spores are slightly larger (Figure 5-b1). However, *T. affinis* and *T. persimilis* differ by the color of the sporophores, with *T. affinis* being grayish-yellow (4B5) to yellow-orange (4B8) (Figure 2-a, b, c), while *T.*

*persimilis* is yellowish brown (5D7) (Figure 4); the number of spines along the capillitium, with *T. persimilis* having a greater amount of spines (Figure 5-c2); the band of the spores, being slightly larger and more constant in *T. affinis*, while in *T. persimilis* the bands are smaller and present well-marked irregularities on their surface (Figure 5 a1-c1).

**Table 1:** Different macro and microscopic characteristics compared between species

Features	<i>Trichia affinis</i> (Figure 1)	<i>Trichia favoginea</i> (Figure 2)	<i>Trichia persimilis</i> (Figure 3)
<b>Sporophores</b>	Subglobose, sessile, densely grouped, deformed by mutual pressure, grayish-yellow to yellow-orange; 0.2–0.7 mm diam. and 0.3–0.9 total height	Subglobose, sessile, clustered, light brown (5D6) to yellowish brown (5D7); 0.4–0.7 mm diam. and 0.8–1.7 mm high	Globose, sessile, clustered, yellowish brown; 0.4–0.6 mm diam. and 0.4–0.8 mm overall height
<b>Capillitium</b>	Elaters, dark yellow (4A8), apex with sharp tips, 5.2–7.1 µm diam., ornamented with few spines;	Elaters, dark yellow (4A8), apex with sharp or small tips, 5.5–6.3 µm diam.	Elaters, dark yellow (4A8), apex with sharp tips, 4.8–6.4 µm diam., ornamented with many spines
<b>Ornamentation and structure of spores</b>	10–12 µm diam., crosslinked by fickle bands of 1,2–2 µm.	9.5–12 µm diam., crosslinked by fickle bands of, 1.5–2.4 µm.	9.5–1 µm diam., crosslinked by very fickle bands of 0.9–1.5 µm.



**Figure 5:** Illustration of the microscopy of the analyzed species a- *Trichia affinis*. 1- Spores; 2- Capillitium. b- *Trichia favoginea*. 1- Spores; 2- Capillitium. b- *Trichia persimilis*. 1- Spores; 2- Capillitium.

## Conclusion

The present study contributes to the expansion of the knowledge of the myxobiota of the Brazilian Cerrado, with the addition of new records of occurrence of *T. affinis* in conservation units of this biome in the state of Goiás, demonstrating the importance of maintaining these areas for biodiversity.

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