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Almost invisible tenants: Myxomycetes inhabiting anthropogenic environments in Central Brazil

Toschi LA, Leonardo-Silva L, Oliveira-Messias R, Moreira IC, Xavier-Santos S

Laboratory of Basic, Applied Mycology and Scientific Dissemination (FungiLab), State University of Goiás, Anápolis, Brazil.

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Abstract

Myxomycetes are widely distributed organisms in terrestrial ecosystems, colonizing a wide variety of substrates and playing important ecological roles in nutrient cycling and microbial regulation. Although their presence in natural environments is better documented, their occurrence in anthropogenic habitats remains poorly understood. This study investigated the diversity and distribution of myxomycetes in human-modified environments in Central Brazil, in areas formerly occupied by the morphoclimatic domain of the Cerrado. In addition to accounting for sporophores observed in the field, substrate samples including decaying wood, leaf litter, cardboard, and paper-were collected from urban and peri-urban areas (such as homes, urban parks, and flowerbeds) and incubated in moist chamber cultures. A total of 57 species were recorded, primarily in the orders Physarales and Stemonitales. The Physarales exhibited greater species richness and abundance, and several species demonstrated broad tolerance to artificial substrates. Sporophores and plasmodia were observed on a variety of substrates, including leaves, branches, dead wood, fruit, seeds, horse faeces and even objects used by humans, such as ceramic pots, rugs, tiles and furniture. Species such as *Didymium squamulosum*, *Physarum viride*, and *Fuligo septica* were frequently observed, indicating possible adaptation to disturbed environments. *Physarum braunianum*, *P. carneum* and *P. luteolum* were recorded for the first time in Brazil, while *Ceratiomyxa sphaerosperma*, *Symphytocarpus flaccidus* and *P. decipiens* in Cerrado. The results highlight the ecological plasticity of myxomycetes and suggest that anthropogenic substrates may serve as viable microhabitats, especially in urban ecosystems where natural substrates are scarce. This study contributes to the recognition of myxomycetes as resilient components of microbial biodiversity and reinforces the importance of expanding research to include neglected or artificial environments. This is one of the first studies to systematically document myxomycete diversity in anthropized contexts in Brazil.

Keywords – Artificial substrates – Brazilian savanna – Ecological plasticity – Microhabitats – Moist chamber culture – Myxogastria – Myxophilia –Urban biodiversity

Introduction

The process of urbanization leads to the fragmentation of natural habitats, promoting significant and varied impacts on ecological communities across different taxonomic groups

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Corresponding Author: Lucca de Araujo Toschi – e-mail – lucca.toschi.bio@gmail.com

(McKinney 2008). For example, the richness of plant species is often higher in urban environments compared to natural settings, not only due to increased habitat heterogeneity but also through the introduction of exotic species by human activities (kühn et al. 2004, Walker et al. 2009, Gavier-Pizarro et al 2010, Kowarik & Pyšek 2012). Urban areas are more than spaces devoid of native vegetation and covered in concrete. Instead, they are reshaped ecosystem that offer novel habitats and foster diverse ecological interaction (Kowarik & Pyšek 2012).

Beyond the visible organisms, the microscopic—or almost microscopic—organisms that inhabit domestic environments are equally complex and diverse. Among these, myxomycetes stand out as fascinating organisms, present in a diversity of ecosystems, from humid and shady environments (favourable conditions) to extreme habitats such as cold regions (Schnittler et al. 2015, Janik et al. 2022) and arid zones (Blackwell & Gilbertson 1984, Ferreira & Cavalcanti 2011, Silva & Cavalcanti 2012). Myxomycetes are closely related to plants and their detritus (Ferreira & Cavalcanti 2010, Ferreira & Cavalcanti 2011, Araújo et al. 2012, Sá et al. 2019), as the microhabitats created by decaying plant material provide ideal conditions for their development (Ferreira & Cavalcanti 2010).

Myxomycetes are a group with very well-defined stages in their life cycle, an assimilative stage in the form of amoeboflagellated or a plasmodium, a conservation phase in the form of sclerotia and a reproductive phase in the form of a fruiting body, characterized by a mass of spores supported by non-tissue membranes of different shapes (Martin & Alexopoulos 1969). Brazil currently has just over 270 known species of myxomycetes, with the Cerrado morphoclimatic domain being the second richest region in terms of species in the country, contributing around 40 per cent of the records (Flora e Funga do Brasil 2025). With the aim of increasing knowledge about the environments where myxomycetes can grow, this study investigated the myxobiota present in terrestrial and vertical dwellings, urban parks and flowerbeds in cities in the state of Goiás, all of which are located in the Cerrado morphoclimatic domain.

Materials & Methods

The species list was compiled based on a review of the myxomycetes collection at the Fungarium of the Universidade Estadual de Goiás (HUEG-Fungi) found in anthropogenic environments, as well as from new collections, including both sporophores observed in the field and those resulting from incubations of plasmodia and plant debris collected in these environments, especially in domestic gardens. The incubation took place in the dark at room temperature (25 – 30°C), until sporophores were produced. All the samples collected and obtained in the moist chambers were deposited in the HUEG Fungi (Table 1).

The identification of samples was carried out using traditional methods, analysing macro- and microscopic structures, according to Martin & Alexopoulos (1969), Farr (1976) and Poulain et al. (2011a, 2011b). Maintaining the tradition of years of research, we included Ceratiomyxales in this list even though it does not belong to the Myxomycetes group, but rather to the Protosporangiida group (Kang et al. 2017). In the macromorphological analysis, colour indication was based on Kornerup & Wanscher (1978).

We carried out the geographical distribution for species recorded as first occurrences in Brazil and in the Phytogeographical domain of the Cerrado based on research from published articles, books, theses, and dissertations, as well as online databases: CRIA (https://specieslink.net/), Flora e Funga do Brasil (https://floradobrasil.jbrj.gov.br/FB120170) and GBIF (https://gbif.org/). For species with new records in Brazil, distribution was assessed on a continental level, while species newly recorded in the phytogeographic domain, distribution was surveyed by macro-region and state.

Results

We found 57 species representing 23 genera, 8 families and 6 orders. The most representative order was Physarales with 78% of specimens obtained, followed by Trichiales with 12%,

Stemonitales with 5%, Ceratiomyxales with 3% and Cribrariales and Reticulariales both with 1%. Sporophores and plasmodia were found developing on various substrates: leaves, branches, dead wood, fruits, horse faeces, seeds and even on objects for human use, such as ceramic vases, rugs, tile and furniture. Among the species founded, three new occurrences were recorded for Brazil: *Physarum braunianum*, *P. carneum* and *P. luteolum*; and three for the Cerrado morphoclimatic domain: *Ceratiomyxa sphaerosperma*, *Symphytocarpus flaccidus* and *P. decipiens*

New records from Brazil

***Physarum braunianum* de Bary, in Rostaf., Sluzowce monogr. 105. 1874**.

Specimen examined: BRAZIL, Anápolis, Goiás, 16°19'13"S 48°55'44"W, 999 m, growing on basidiome of poroid fungus, 30–I–2024, Toschi LA 86, HUEG 17095.

Phaneroplasmodium yellowish orange (4B7). Fructifications sessile, scattered to sparsely gregarious, 0.2–0.4 mm in total height. Sporophores constricted at the base, subglobose, olive-brown (4D3), 0.3–0.6 mm in diameter. Peridium membranous, often densely covered with deep yellow clusters (4A8), dehiscent from the top, star-shaped. Hypothallus absent. Columella absent. Capillitium dense physaroid, with calcareous granules light yellow to brownish orange, angular or lobed in some regions, connected by a network of hyaline threads. Spores 8–10 um in diameter, dark brown in masses, purple brown under transmitted light, globose, warty, sometimes with more concentrated groups of warts, forming small dark spots.

Geographic distribution: Asia (Liu et al. 2002), Europe (Varis et al. 2016), North and South America (Zoll & Stephenson 2013), Oceania (Meisterfeld et al. 2012).

Notes: The plasmodium was collected from a resident's flowerbed, developing on the basidioma of some poroid fungi. The plasmodium was incubated in moist chamber containing previously autoclaved *Pinus* sp. bark. After four days, the material fruited. Our material is similar to that described by Poulain et al. (2011a, 2011b) (same sample present in MyxoTropic (https://myxotropic.org/physarum-2/)). Varis et al. (2016) comments that *P. braunianum* is similar *P. lateritum* and *P. rubiginosum*, due to the reddish color of the peridium, but the orange surface granulation of the peridium and the yellowish or brownish annular calcareous nodes stand out. In addition, our sample shows great similarities with the image of the *P. superbum* sample on the MyxoTropic website (https://myxotropic.org/bws-gallery/physarum-superbum/), although our voucher is different from other *P. superbum* vouchers in the literature (Wrigley de Basanta et al. 2008, Poulain et al. 2011a, 2011b).

***Physarum carneum* G. Lister & Sturgis, in G. Lister, J. Bot. 48: 73. 1910.**

Specimen examined: BRAZIL, Anápolis, Goiás, 16°19′07″S 48°55′43″W, 991 m, on dead wood, 05–III–2023, Toschi LA 88, HUEG 16500.

Sporophore stalked, 0.8–1.2 mm tall. Sporotheca globose, 0.4 mm diam. Stalk wide, cylindrical, as tall as the sporotheca, concolorous with the peridium, sometimes with lilac shades. Hypothallus membranous light brown (6D7) to brownish orange (6C3). Peridium simple, light brown (6D7) to golden brown (5D7), with calcareous granules, breaking apart in an irregular and tessellated manner. Columella absent; Capillitium physaroid with large white calcareous granules, rounded to shortly elongated, linked by hyaline filaments. Spores 9–11 µm in diameter., violaceous-brown, warty.

Geographic distribution: Asia, Europe, Oceania (GBIF), North America (Martin & Alexopoulos 1969) and South America, previously recorded only in Argentina (Moreno et al. 2020).

Notes: Its was collected in a backyard under a mango tree (*Mangifera* sp.), growing on decaying wood waste. The sample is similar to the voucher in Poulain et al. (2011a; 2011b) and Moreno et al. (2020).

Table 1 Distribution of the species found in anthropogenic environments, according to taxonomic position, substrate, life cycle phase and voucher in the HUEG herbarium. S = sporophore; P = plasmodium.

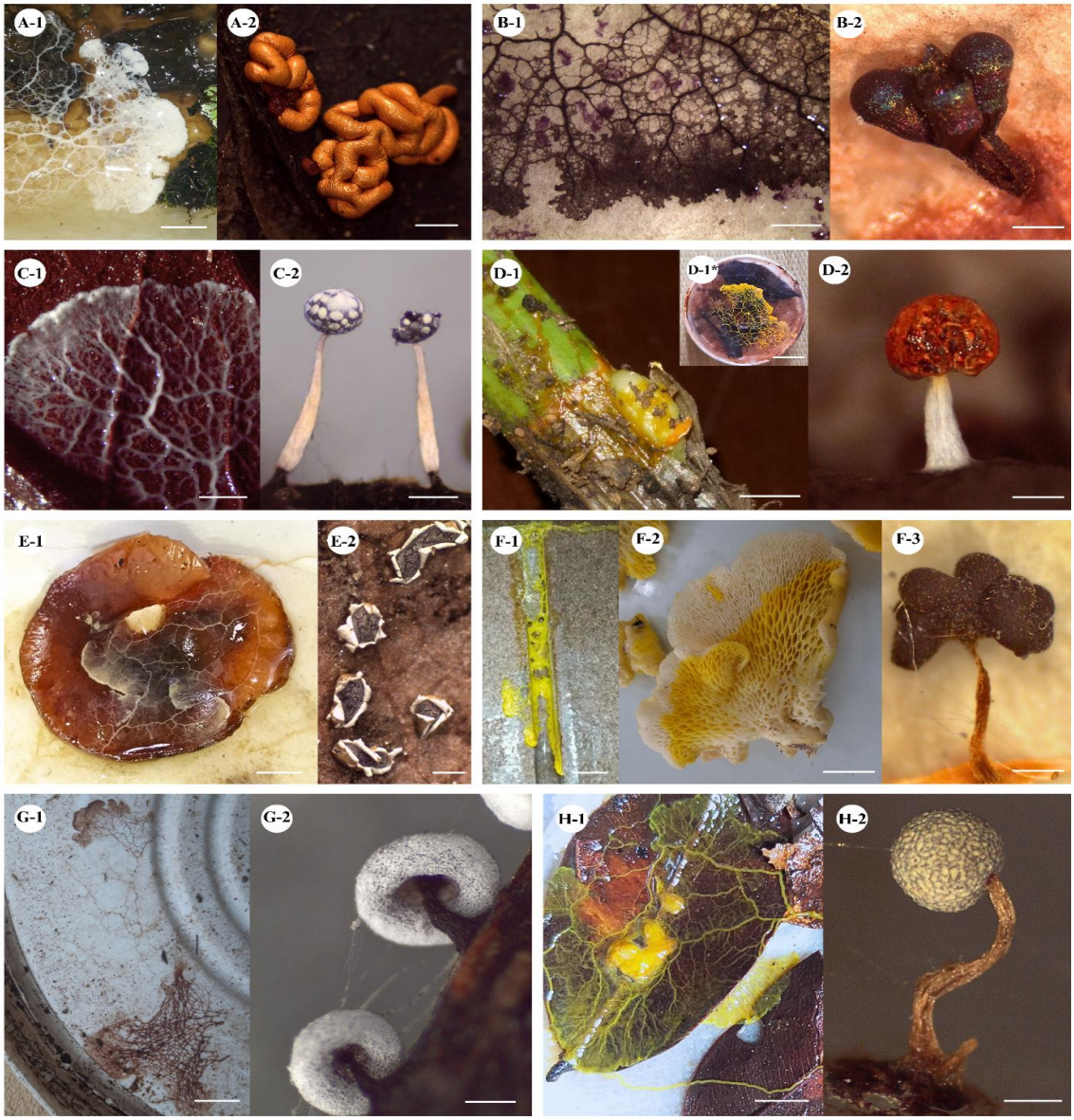
Taxa	Substrate	Observed phases (S or S/P)	HUEG voucher
Ceratiomyxales			
Ceratiomyxaceae			
Ceratiomyxa fruticulosa	*Phalaenopsis cascata* vessel substrate; rug; dead wood	S/P	8351, 13034, 16518
Ceratiomyxa sphaerosperma	Decomposing fruit of *Psidium guajava*	S/P	16496
Cribrariales			
Cribrariaceae			
Cribraria violacea	Rug	S	8352
Cribraria cancellata	Dead wood	S	13037
Physarales			
Didymiaceae			
Diachea bulbillosa	*Mangifera* sp. leaf	S	13980
Diachea leucopodia	Leaves and twigs of *Capsicum* sp.; *Eugenia uniflora* and *Mangifera* sp. leaves; rug	S	9352, 9752, 9497, 9580, 9592, 13974, 13977, 13998, 13999, 14002
Diderma effusum	*Mangifera* sp. leaf; equine faeces; *Ruelia blechum.*	S	9556, 9558, 9576, 19028
Diderma chondrioderma	Dry twigs and leaves	S	13985, 13987, 14000, 16494
Diderma saundersii	*Mangifera* sp. leaf	S	9499, 9591, 9599,
Diderma hemisphaericum	*Mangifera* sp. and *Ixora coccinea* leaves	S	9175, 9546, 13973, 13988, 13997, 16488, 18532
Didymium clavus	Compost bin; the trunk of *Phoenix* sp.; coconut fiber pot; leaves of *Musa* sp.	S/P	9322, 16484, 16486, 16503
Didymium columellacavum	Dead branch	S	16674
Didymium flexuosum	Kernel and leaf of *Mangifera* sp.	S	9197, 9578, 9586, 13972, 13990
Didymium iridis	*Mangifera* sp. leaf	S/P	14001, 13975
Didymium megalosporum	*Mangifera* sp. leaf	S	9557
Didymium melanospermum	*Mangifera* sp. leaf	S	16677
Didymium squamulosum	*Mangifera* sp. leaf	S	13978, 13994, 19027
Physaraceae			
Badhamia affinis	*Mangifera* sp. seed	S	16678
Badhamia macrocarpa	*Musa* sp. leaf; equine faeces	S	9321, 9323
Badhamia polycephala	Fruiting bodies of *Favolus* sp.; on ceramic floor; on tile	S/P	8301, 8315, 9569,13035
Craterium aureum	*Mangifera* sp. seed; on succulent plant	S	9520, 9622
Craterium leucocephalum	*Mangifera* sp. leaf	S	13020, 14048

Table 1 Continued

Taxa	Substrate	Observed phases (S or S/P)	HUEG voucher
Fuligo septica	Dead wood; culture medium discarded; compost bin; *Eugenia uniflora* leaves	S/P	14157, 14676, 18396, 19029
Nannengaella leucopus	Trunk of *Bauhinia forficata;* moss	S	16482
Nannengaella mellea	Vase of *Morus alba*; pitcher of *Nephentes graciliflora*; dead wood; residues of *Mangifera* sp.; in succulent; *Psidium guajava* leaf; live branch of *Epidendrum radicans.*	S/P	8215, 8295, 9341, 9395, 9547, 9549, 9550, 9551, 9552, 9553, 9559, 9560, 9572, 9590, 9593, 9581, 9582, 9584, 9585, 9587, 9588, 9589, 9590 9602, 9605, 9623, 9627, 9289, 9637, 9638, 9641, 13976, 13986, 13993, 13995, 16332, 16499
Physarella oblonga	Stone, leaves and wood of *Mangifera indica*	S/P	9196, 14142
Physarum album	*Phoenix* sp. trunk; coconut palm waste; vegetable garden substrate	S	8210, 8212, 14085, 16487
Physarum bogoriense	Dead leaf; *Psidium guajava* leaf*;* basidiomata of *Auricularia* sp.	S/P	9506, 9507
Physarum braunianum	Basidioma of poroid fungus	S/P	17095
Physarum carneum	Dead wood	S	16500
Physarum cinereum	Dead wood	S	13036
Physarum compressum	*Morus alba* live branch	S/P	16492, 16501, 16676
Physarum decipiens	*Syagrus romanzoffiana* trunk	S	16483
Physarum flavicomum	*Mangifera* sp. seed	S	16675
Physarum luteolum	Bonsai wood of *Punica granatum*	S/P	16504
Physarum notabile	Rug; peel of the decomposing fruit of *Persea americana*	S/P	9152, 16490
Physarum nucleatum	Vase residues of *Capsicum baccatum*	S/P	16679
Physarum oblatum	*Musa* sp. peel in homemade compost	S	18397
Physarum pusillum	*Psidium guajava* leaf	S	9569
Physarum stellatum	*Syagrus romanzoffiana* trunk	S/P	16483
Physarum viride	*Morus alba* residues	S/P	8241, 16498, 16489
Reticulariales			
Reticulariaceae			
Lycogala epidendrum	Dead wood	S	9501
Tubifera microsperma	On culture medium (PDA) discarded in the garden	S	14716
Stemonitales			
Stemonitaceae			
Comatricha tenerrima	Horse faeces	S	8302
Comatricha nigra	Residues of *Salvia rosmarinus* (rosemary)		
Lamproderma scintillans	*Psidium guajava* trunk	S	9545

Table 1 Continued

Taxa	Substrate	Observed phases (S or S/P)	HUEG voucher
Stemonits fusca	Liana waste	S	16520
Stemonits herbatica	Compost bin	S/P	16519
Stemonitis pallida	Succulent plant	S	8219
Symphytocarpus flaccidus	Wooden furniture	S	16497
Trichiales			
Arcyriaceae			
Arcyria cinerea	Decorative deadwood in garden; liana; dead leaf	S	13033, 14144, 14145, 16495, 16521
Arcyria denudate	*Phoenix* sp. trunk	S	16485
Arcyria pomiformis	Dead leaves	S	16493
Perichaena depressa	*Psidium guajava* leaf	S	16673
Trichiaceae			
Hemitrichia calyculata	Coconut tree stem	S	8293
Hemitrichia serpula	*Psidium guajava* trunk; decorative dead wood in garden	S/P	8307, 8240, 9505,16502
Metatrichia vesparia	Dead wood	S/P	9504, 9493, 13032, 16491
Oligonema persimile	Dead wood	S	14143
Trichia decipiens	Basidioma of poroid fungus	S	8331



Figs 1 – Some of the myxomycetes found in domestic environment (1 or 3 = plasmodium. 2 = sporophore). A *Hemitricha serpula* (Scale bar 1= 2 cm, 2 = 8 mm). B *Metatrichia vesparia* (Scale bar 1= 0.4 mm, 2= 0.3 mm). C *Physarum stellatum* (Scale bar 1= 2 cm, 2= 8 mm). D *Nannengaella mellea* (Scale bar 1= 1 mm, 1*= 3 cm, 2= 0.5 mm). E- *Physarum bogoriense* (Scale bar 1= cm, 2= 0.5 mm). F *Badhamia polycephala* (Scale bar 1= cm, 2= 2 cm, 3= 0.1 cm). G *Didymium clavus* (Scale bar 1= 3 cm, 2= 0.2 mm). H *Physarum nucleatum*. (Scale bar 1= 1 cm, 2= 0.1 mm).

***Physarum luteolum* Peck, Annual Rep. New York State Mus. 30:50. 1878.**

Specimen examined: BRAZIL, Anápolis, Goiás, 16°19′07″S 48°55′44″W, 991 m, sclerotia collected from bonsai stem of *Punica* sp., 15–IV–2023, Toschi LA 92, HUEG 16504.

Phaneroplasmodium greyish orange (5B4). Sporophore sessile, with non-standard sizes and shapes, 0.3 mm high, extension 0.3–0.5 × 0.3–1 mm. Hypothallus not observed. Peridium simple, brownish gray (4D2), scorched yellowish orange (4B7). Capillitium physaroid with large white calcareous granules, rounded and somewhat elongated, united by hyaline filaments. Spores 9.5–11 µm in diameter, violaceous-brown, warty.

Geographic distribution: Asia, Africa, Australia, Europe, North America (Cannon & Minter 2017) and in South America, previously recorded only in Argentina (Lado et al. 2014).

Notes: It was collected as a sclerotium, attached to the trunk of a pomegranate bonsai tree (*Punica* sp.). The sclerotia (Figs 3 A1) are light orange and may or may not have a white hypothallic mass.

It was collected by carefully scraped and incubated in a moist chamber, reverting to a plasmodium approximately 10 hours after incubation, with a very light orange colour. The plasmodium fructified five days after incubation and was then identified. At the start of fruiting, the sporophore is light yellow and then turns its final colour (Figs 3A).

New records from the Cerrado morphoclimatic domain

***Ceratiomyxa sphaerosperma* Boedijn, Misc. Zool. Sumatr. 24:1. 1927.**

Specimen examined: BRAZIL, Anápolis, Goiás, 16°20′06″S 48°57′03″W, in *Psidium guajava* fruit, 08–II–2023, Toschi LA 85, HUEG 16496.

Plasmodial mass hyaline. Sporophore stalked, 0.8–1.5 mm total hight, when fresh the stalk is gelatinous, bulky (0.3–0.4 mm in diameter) and hyaline, after drying it becomes thin (0.1–0.2 mm in diameter), membranous and white. Sporotheca branched into several spore-releasing capillaries, white (1A1), rarely orange white (5A2). Peridium, capillitium, columella, and pseudocolumella absent. Hyaline white hypothallus (1A1). Pedicel membranous, turgid, hyaline to white (1A1) when fresh, after drying it becomes membranous and matches the colour of the sporotheca. Spores 6.0–8.6 µm in diameter when subglobose or 5.1–6.5 × 9.0–14.0 µm when ellipsoid, hyaline, smooth, individually attached to a finger-like stalk which is uniform in length throughout the sporophore.

Geographic distribution in Brazil: Atlantic Forest areas – Northern in Amapá, Amazonas, Pará, Roraima; Northeastern in Alagoas, Bahia, Ceará, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, Southeastern in São Paulo and South region in Rio Grande do Sul, Santa Catarina (Cavalcanti et al. 2008).

Notes – The sporophores was found developing on decaying guava fruit (*Psidium guajava*). Parts of the protoplasm were also observed, preparing to fructify, being a slightly gelatinous, delicate and hyaline mass. In the place where it was collected, there is a large amount of accumulated organic matter, and it is very common to see this species during the rainy season.

***Physarum decipiens* M.A. Curtis, Amer. J. Sci. Arts, ser. 2 6:352. 1848.**

Specimen examined: BRAZIL, Anápolis, Goiás, 16°19′07″S 48°55′43″W, 991 m, stem of *Syagrus romanzoffiana*, 15–XII–2023, Toschi LA 37, HUEG 16483.

Sporophore sessile, 0.3–0.8 mm high and 1.5–2 × 0.3–0.4 mm wide. Plasmodiocarpal sporotheca. Hypothallus not observed. Peridium simple, brittle and warty, beige (4C3), scorched yellow (4A4). Capillitium physaroid with large white calcareous granules, rounded to slightly elongated, connected by hyaline filaments. Spores 10–11 µm in diameter, violet-brown, warty.

Geographic distribution in Brazil: Atlantic Forest areas – Northwest in Pernambuco (Barbosa et al. 2016, Sá et al. 2022), Rio Grande do Norte, Sergipe and Southwest in São Paulo (Flora e Funga do Brasil 2025).

Notes – It was collected during the rainy season from the straw of *Syagrus romanzoffiana* grown in an urban park, fruiting next to a large quantity of *Physarum stellatum* (HUEG 16483).

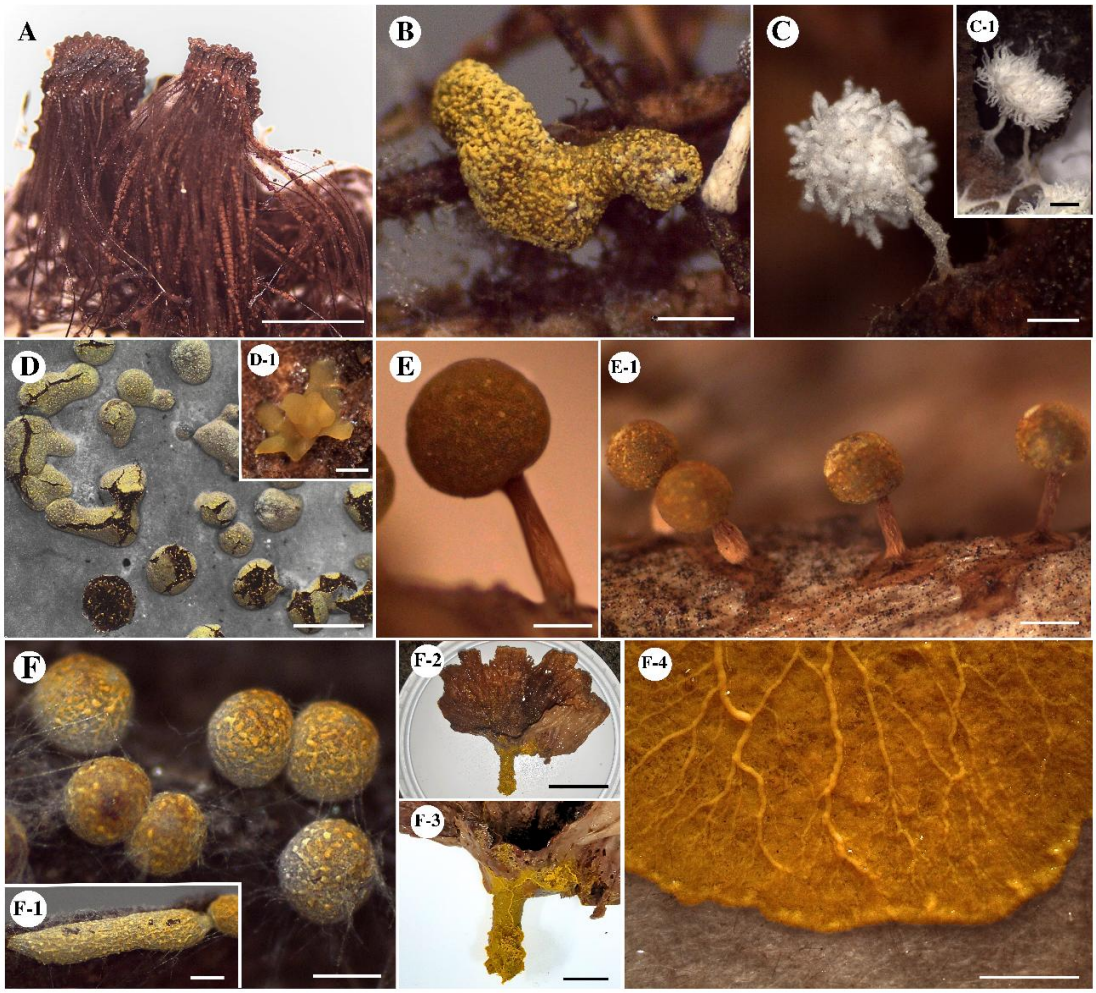
***Symphytocarpus flaccidus* (Lister) Ing & Nann.-Bremek., Proc. Kon. Ned. Akad. Wetensch., C. 70(2):217. 1967.**

Specimen examined: BRAZIL, Caldas Novas, Goiás, 17°42′30″S 48°39′26″W, 991 m, fruited on wooden furniture, 25–VII–2023, Silva WR 01, HUEG 16497.

Sporophore stalked, extremely aggregated, 1.4–2 cm in total height. The sporotheca occupies 80% of the sporophore, brown (6E8), fragile, the tops of the sporotheca touch each other during the formation of sporophores, remaining tightly united. Stipe occupied the remaining 20%, dark brown (6F4). Peridium not observed. Hypothallus membranous, hyaline. Capillitium forming an irregular mesh, with abundant membranous expansions. Spores, 7–9 µm in diameter, dark purple, warty.

Geographic distribution in Brazil: Atlantic Forest area - Northwest in Pernambuco (Flora e Funga do Brasil 2025).

Notes – The sample was collected from wooden furniture outside the house. The furniture was exposed to the weather and the humidity made it possible for the myxomycete to grow in this unconventional substrate.



Figs 2 – Species found for the first time in Cerrado (A–C) and in Brazil (D–F). A *Symphytocarpus flaccidus* (Scale bar = 1 cm). B *Physarum decipiens* (Scale bar = 0,1 mm). C, C-1 *Ceratiomyxa sphaerosperma*, (Scale bar C = 0,2 mm, C1 = 0,3 mm). D *Physarum luteolum* (Scale bar = 0,3 mm). D1 Sclerotium (Scale bar= 1 mm). E *Physarum carneum* (Scale bars E= 0,1 mm. E1= 0.3 mm). F, F1 *Physarum braunianum*, F2, F3 plasmodium developing on basidioma of poroid fungus. F4 Plasmodium in moist chamber (bar F, F1 = 0.2 mm, 2, 3 = 1.5 cm. 4 = 1 mm).

Discussion

Myxomycetes in urban environments of the Neotropical region have been studied by Rincón-Marín et al. (2021) who investigated the ecology of these organisms in different urban landscapes. In this study, the focus is on the myxomycetes found in domestic and anthropogenic areas such as parks and flowerbeds throughout the city, compiling a list of the substrates they occupy.

The data analysed here comes both from collections by the authors and from records obtained by students and enthusiasts of myxomycetes. “Myxophilia” – attraction/admiration to myxomycetes, should be worked on so that people get to know these organisms and their role in the environment. Thus, we show that these organisms are abundantly present in our surroundings and even in our homes, forming an important part of the microbial cosmos.

Myxomycetes are organisms that are abundantly present in the environment around us, on living organisms and their waste products, such as plants, fungi, insect carcasses (Stephenson et al. 1994) and on artificial substrates, provided there are suitable conditions, especially humidity and

nutrients to support them (Stephenson & Rojas 2017). And this can happen in the most unlikely, unexpected or curious environments, even where their presence is not very welcome. Like in the MDF (Medium Density Fiberboard) cabinet located in an inhabited residential apartment, that hosted *Symphytocarpus flaccidus* (HUEG 16497). And the rug located under the sink of a laundry area in single storey house, that hosted *Ceratiomyxa fruticulosa* (HUEG 8351) and *Cribraria violacea* (HUEG 8352). About the plasmodium registered on the grout of the ceramic floor of the garage and on the bathroom wall, the collector informed that even washing the area with water and cleaning products it reappeared after a few days. The plasmodium was collected and cultured in a homemade moist chamber made of a plastic container with a lid. When it fructified, it was discovered to be *Badhamia polycephala* (HUEG 8315).

We also observed the development of *Didymium clavus* (HUEG 16503), *Fuligo septica* (HUEG 18396), *Physarum oblatum* (HUEG 18397) and *Stemonitis herbatica* (HUEG 16519) in a home compost bin, a very favourable environment for the proliferation of microorganisms, as it has a lot of organic matter, and because it is a semi-open system, it has higher humidity and temperature. As well as organic matter from the kitchen, leaves were added for foraging purposes from an urban park near the house, which probably carried the spores of these organisms into the compost bin.

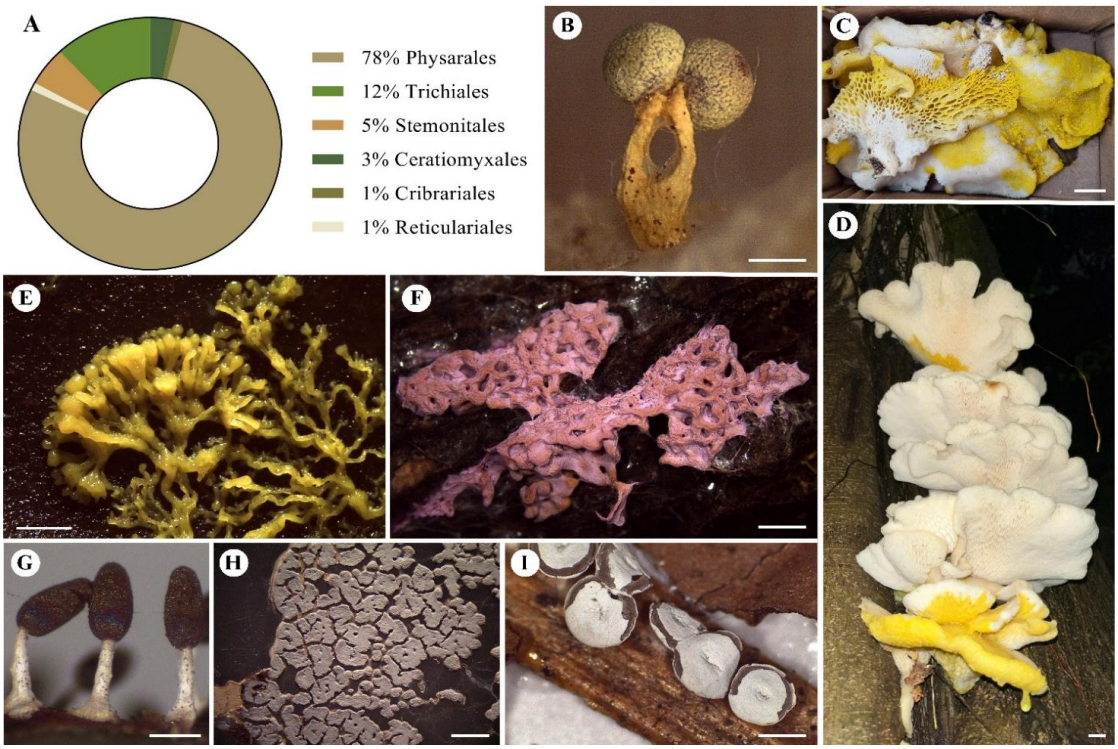
Observations of incubated material and cultivated plasmodia allowed to monitor the life cycle of various species, some of which we have seen better representations in Figure 2, which helps us to get to know some of these organisms in their different stages. However, the order Stemonitales has aphanoplasmodia that are not detectable to the naked eye and can only be glimpsed shortly before the fruiting process begins. On the other hand, the orders Cribrariales, Reticulariales and some representatives of Trichiales have protoplasmodia, thin plasmodial structures that are imperceptible to the naked eye (Alexopoulos 1960, Gray & Alexopoulos 1968, López-Sánchez 1986, Baba et al. 2019).

From this perspective, the records (Table 1) reveal that the order Physarales stands out among the samples obtained (Figure 3 and 4). This prominence is primarily attributed to their phaneroplasmodia, which are typically easy to observe (Alexopoulos 1960, Gray & Alexopoulos 1968), as well as their resilience, enabling them to thrive even in environments with lower humidity (Blackwell & Gilbertson 1984, Ferreira & Cavalcanti 2011, Silva & Cavalcanti 2012). These factors not only facilitate their collection and cultivation but also contribute to their apparent dominance in the studied environments. However, this does not mean that there are in fact more individuals of the Physarales order in these environments, but rather that they become more apparent to collection methods.

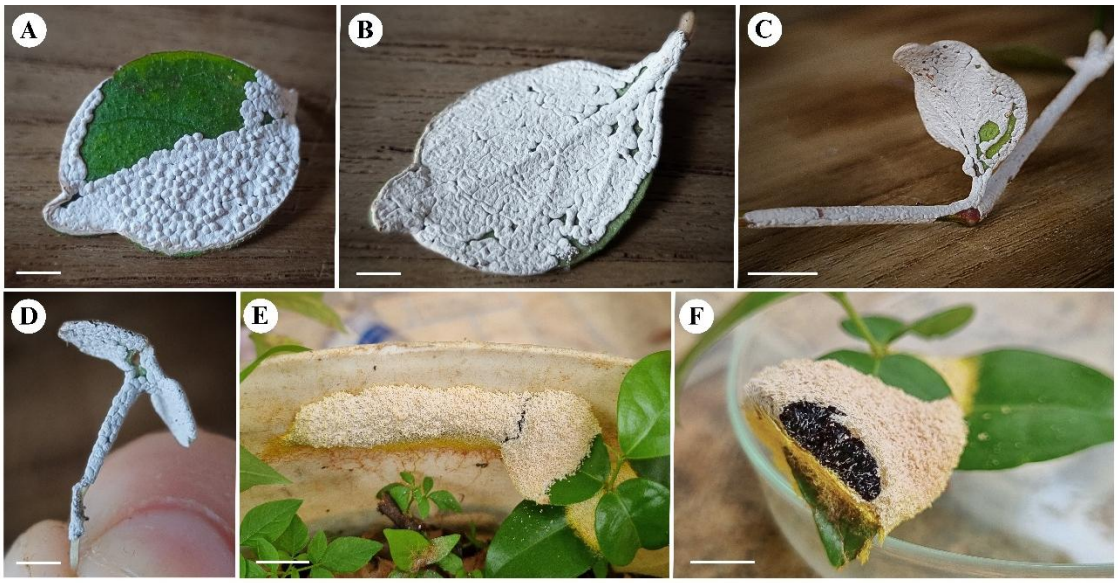
In addition, we observed *Diderma effusum* (HUEG 19028) growing extensively on several plants of the camarão-verde species (*Ruelia blechum*) (Figs 4A, B, C, D) and in some cases even completely covering some seedlings (Figs 4A). A similar pattern was observed with the species *Fuligo septica* (HUEG 19029) which fruited on young pitanga (*Eugenia uniflora*) seedlings (Figs 4E, F). Although this fruiting behavior does not constitute parasitism, it can be harmful to the plant, potentially leading to its death by obstructing sunlight and impairing gas exchange and photosynthesis (Zhang et al. 2024).

Some Trichiales were also easy to grow, specially *Hemitrichia serpula* (HUEG 16502) and *Metatrichia vesparia* (HUEG 16491), obtained from incubating decaying wood and leaves, being easy to replicate on other plates by scraping and being stable cultures, not dying easily. However, apart from these *H. serpula* and *M. vesparia* vouchers, all the plasmodia found in moist chambers of incubated material and all the plasmodia found in the field in this study are Physarales.

We also found species not yet recorded for the Cerrado, or even for Brazil. This shows the versatility of the myxobiota regarding macro and micro habitats and reinforces the importance of studies in different environments. There is the possibility that these species were introduced by humans, coming along with exotic plants and other substrates.



Figs 3 – Conspicuous species found in domestic and anthropogenic environments. A Distribution of abundance by orders. B *Physarum nucleatum* obtained in moist chamber (Scale bar = 0.5 mm). C Plasmodium of *Badhamia polycephala* on basidiomata of *Favolus* sp. (Scale bar = 1.5 cm). D Plasmodium of *Badhamia polycephala* on basidiomata of *Favolus* sp. growing on a tree (Scale bar = 2.5 cm). E Sclerotium of *Fuligo septica* in *Pinus* sp. bark (Scale bar = 2 mm). F Plasmodium of *Badhamia polycephala* in moist chamber (Scale bar = 2 mm). G *Diachea leucopodia* in *Eugenia uniflora* leaf (bar = 0.3 mm). H *Diderma effusum* isolated from debris of *Ixora* sp. fruiting in Petri dishes. I *Diderma hemisphaericum* on *Ixora coccínea* leaves (Scale bar = 0.4 mm).



Figs 4 – *Diderma effusum* (A-D) and *Fuligo septica* (E, F) growing on live plants. A, B Leaf covered by plasmodiocarp, front and back of leaf (Scale bar 0.2 cm). C Plasmodiocarp overing an adult camarão-verde (*Ruelia blechum*) plant. D Seedling almost completely covered by *Diderma effusum* plasmodiocarp (Scale bar 0.5 cm). E, F *Fuligo septica* in a potted plant, growing on part of the pitanga (*Eugenia uniflora*) plant. E (Scale bar 0.4 cm). F (Scale bar 0.7 cm).

Conclusions

The abundant presence of myxomycetes in domestic environments demonstrate the microbial diversity that coexists with us daily. Identifying and documenting these species not only expand our understanding of local biodiversity but also demonstrates the ecosystem potential of these environments for the installation of these organisms. Therefore, their adaptations and their ability to thrive in diverse conditions point to the resilience and versatility of these organisms. Moreover, the diversity of myxomycetes found emphasizes the need to recognize them not as distant or isolated components of our surroundings but as integral elements of the "domestic ecosystem".

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