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Phytoseiidae mites (Acari: Mesostigmata) in pastures from Goiás state, Brazil

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Original research

ABSTRACT

Phytoseiidae mites are represented by more than 2,700 species commonly found in plants and soil with some species widely used in biological control programs worldwide. Knowledge of mite diversity in pastures and interactions between Phytoseiidae and grasses is essential for developing more efficient and sustainable management techniques for this crop. Here, we present a survey of Phytoseiidae species in pastures from Goiás State, Brazil, to contribute to the knowledge of the diversity and abundance of these predatory mites. We sampled 15 country properties in the Cerrado domain that had pasture crops used for cattle farming, for a total of 480 samples, from eight different Poaceae species. We recorded 21 species from 10 genera, including 11 new records for Goiás and two species collected for the first time since their original descriptions, namely *Amblyseius atibaiensis* Mineiro, Lofego and Sato and *Proprioseiopsis biologicus* Lofego, Demite and Moraes. Only *Iphiseiodes zuluagai* Denmark and Muma, *Neoseiulus benjamini* (Schicha), *Proprioseiopsis mexicanus* (Garman) and *Proprioseiopsis biologicus* Lofego, Demite and Moraes had previously been reported in Brazilian pastures, while the remaining species are new records in these ecosystems. *Proprioseiopsis ovatus* (Garman), *N. benjamini* and *P. mexicanus* were the most abundant species, whereas only a single individual was found for *Amblyseius acalyphus* Denmark and Muma, *Amblyseius compositus* Denmark and Muma, *A. lofegoi*, *I. zuluagai*, *Neoseiulus gracilis* (Muma), *Metaseiulus* (*Metaseiulus*) *camelliae* Chant and Yoshida-Shaul and *Silvaseius barretoae* Yoshida-Shaul and Chant. These results highlight pastures as reservoirs for predatory mites, with potential for biological control in agroecosystems. However, further studies are necessary to better understand this diversity.

Keywords Brazilian savannah; Cerrado; livestock; Poaceae; Predatory mites

Introduction

Phytoseiidae includes more than 2,700 valid species with 257 species recorded in Brazil (Demite *et al.* 2025). These mites occur primarily on plants (Schmidt 2013), but some species have also been found in soil samples (Moraes *et al.* 2024). Phytoseiids are natural predators of several phytophagous arthropod species and nematodes. Some species are also used in biological control programs to manage mite and insect pests on crops (McMurtry *et al.* 2013; Moraes *et al.* 2024). Because of these attributes, these mites are widely studied in several crops (Döker *et al.* 2023; Hyte *et al.* 2023; Möth *et al.* 2023).

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Approximately 40.3% of the territory of the state of Goiás, Brazil, is represented by pastures used for livestock production (LAPIG 2023). Poaceae species are used for fodder and soil cover and are typically adopted by producers due to their high productivity (Shavanov 2021). Despite their ecological and agricultural relevance, studies on mites in Brazilian pastures remain scarce, particularly in the Cerrado biome (Flechtmann 2000, 2004; Flechtmann and Navia 2007; Lofego *et al.* 2009). Flechtmann (2000) described two new species, *Aceria aristidae* Flechtmann and *Aceria zoostrix* Flechtmann (Eriophyidae), on *Aristida* (Poaceae) in São Paulo. Flechtmann (2004) recorded 10 species of phytophagous mites occurring on *Urochloa ruziziensis* (R. Germ and C.M. Evrard) Crins (Poaceae) in the state of São Paulo, including description of two new species, namely *Catarhinus brachiariae* (Diptilomiopidae) Flechtmann and *Eotetranychus herbicolus* Flechtmann (Tetranychidae). Flechtmann and Navia (2007) reported the first occurrence of *Tetranychus* (*Armenychus*) *graminae* Flechtmann (Tetranychidae) in central Brazil, causing an elephant grass infestation. Furthermore, Lofego *et al.* (2009) recorded 21 phytoseiid mite species in Brazilian pastures, with the description of a new species, *Proprioseiopsis biologicus* Lofego, Demite and Moraes.

Understanding the biodiversity of agricultural systems is essential for elucidating the ecological interactions between mites and their host plants. Accordingly, our goal was to provide the first comprehensive survey of Phytoseiidae mites in cultivated pastures across Goiás State, documenting their diversity, abundance, and associations with their host grasses.

Material and methods

Study area

Phytoseiidae mites were sampled during the rainy season in pastures between November and December 2022 in 15 livestock farms from Brazabrantes, Caturaí, Inhumas, Itaberaí, Itauçu and Nova Veneza municipalities, Goiás State, Brazil. Between January and May of 2023, all the same farms were sampled once more, except for the Itauçu 1 (Figure 1, Table 1).

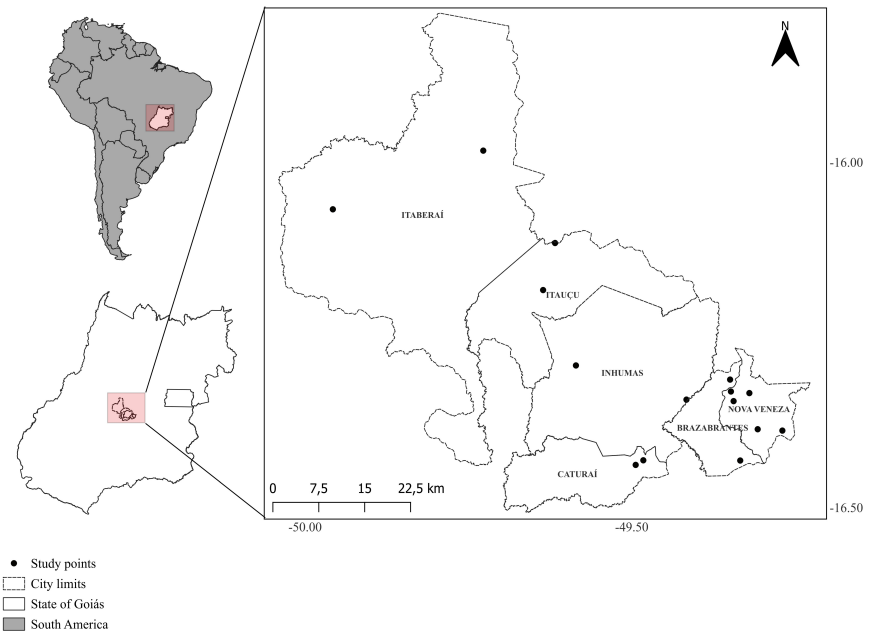

Figure 1 Sampling sites in pastures of livestock farms in the municipalities of Brazabrantes, Caturaí, Inhumas, Itaberaí, Itauçu e Nova Veneza, State of Goiás, Brazil.

All farms sampled were in the Cerrado domain and grew pastures of the species *Cynodon nlemfuensis* Vanderyst, *Urochloa arrecta* (Hack. Ex T. Durand and Schinz) Morrone and Zuloaga, *Urochloa brizantha* (Hochst. ex A.Rich.) R.D. Webster, *Urochloa decumbes* (Stapf) R.D.Webster, *Urochloa humidicola* (Rendle) Morrone and Zuloaga, *Urochloa lorentziana* (Mez) Morrone and Zuloaga, *Urochloa plantaginea* (Link) R.D. Webster, and *Urochloa ruziziensis* (R. Germ. and C.M. Evrard) Crins (Poaceae) for livestock production.

Table 1 Geographic coordinates of pastures for Phytoseiidae sampling in livestock farms from Brazabrantes, Caturaí, Inhumas, Itaberaí, Itauçu and Nova Veneza municipalities, Goiás State, Brazil.

Locality	Geographical coordinates
Nova Veneza 1	16°20'50.03"S, 49°20'43.87"W
Nova Veneza 2	16°19'59.92"S, 49°20'58.99"W
Nova Veneza 3	16°23'21.55"S, 49°16'13.98"W
Nova Veneza 4	16°20'7.40"S, 49°19'17.40"W
Itauçu 1	16°11'18.56"S, 49°38'16.62"W
Itauçu 2	16°7'12.72"S, 49°37'12.58"W
Caturaí 1	16°26'26.66"S, 49°29'40.34"W
Itaberaí 1	15°59'12.91"S, 49°43'50.48"W
Itaberaí 2	16°4'23.77"S, 49°57'33.50"W
Nova Veneza 5	16°23'15.44"S, 49°18'30.00"W
Brazabrantes 1	16°25'59.52"S, 49°20'4.78"W
Caturaí 2	16°26'2.36"S, 49°28'58.51"W
Inhumas 1	16°17'50.28"S, 49°35'13.20"W
Inhumas 2	16°20'44.16"S, 49°25'3.50"W
Brazabrantes 2	16°18'57.89"S, 49°21'4.07"W

Mites collection

We randomly established five sampling plots on each livestock farm, totalizing 480 samples. Each plot was represented by a 1-square-meter area in the pasture where we collected grasses. At each sampling plot, we collected 2 L of grasses in a recipient, including all plant extensions such as stalks, nodes, internodes and leaves, except for rhizomes. Then, the sampled grasses were kept in individual paper bags (one bag per sampling plot) in a Styrofoam box with ice for transport. In the laboratory, the grasses were immersed in a 5 L container of 30% alcohol, which was shaken vigorously to release the Phytoseiidae mites from the plants. After this procedure, the grasses were removed, and the solution was transferred to a 25 µm mesh sieve. The mites that were trapped in the mesh were transferred to a pot containing 70% alcohol.

The samples were observed under stereomicroscope and all mites found were mounted on microscope slides using Hoyer's medium (Moraes *et al.* 2024). Phytoseiidae mites were counted and identified to the species level under a phase-contrast optical microscope using specialized dichotomous keys for genera and subgenera (Chant and McMurtry 2007) and works on descriptions, redescriptions, and revisions of Phytoseiidae (e.g., Barbosa and Demite 2023; Ferragut and Navia 2024; Lofego *et al.* 2024).

The list of mites collected in pastures from the state of Goiás, Brazil, includes the following information about the examined material: collection locality, grass species, month of sampling in Roman numerals, year in Arabic numerals, and the number of individuals of each sex (indicated by symbols ♀ and ♂). Additionally, the list provides previous records and observations. We extracted the previous records of Phytoseiidae species from the Phytoseiidae Database (Demite *et al.* 2025), available at: http://www.lea.esalq.usp.br/phytoseiidae.

Results

We sampled 21 species from 10 genera of Phytoseiidae in pasture crops in Goiás State, Brazil. Among these, seven genera belonged to Amblyseiinae, and three to Typhlodrominae (Table 2).

Table 2 Composition and abundance of Phytoseiidae species sampled in pastures from 15 livestock farms in the state of Goiás, Brazil.

Phytoseiidae species	CNL*	UAR	UBR	UDE	UHU	UPL	URU
Amblyseiinae Muma							
Amblyseius acalyphus Denmark and Muma			1				
Amblyseius atibaiensis Mineiro, Lofego and Sato			27			4	
Amblyseius compositus Denmark and Muma			1				
Arrenoseius lofegoi Barbosa and Demite			1				
Iphiseiodes zuluagai Denmark and Muma			1				
Neoseiulus benjamini (Schicha)	1		57		1	2	1
Neoseiulus gracilis (Muma)			1				
Neoseiulus paraibensis (Moraes and McMurtry)		1	5				
Neoseiulus transversus Denmark and Muma	1		13	1	1	3	1
Proprioseiopsis biologicus Lofego, Demite ans Moraes			11				
Proprioseiopsis mexicanus (Garman)	3	2	43	1	4	10	
Proprioseiopsis neotropicus (Ehara)			2				
Proprioseiopsis ovatus (Garman)	1	2	151		3	18	
Proprioseiopsis pentagonalis (Moraes and Mesa)			8			3	
Typhlodromalus aripo De Leon			2				
Typhlodromalus clavicus Denmark and Muma	1						
Typhlodromalus peregrinus Muma			2			1	
Typhlodromips mangleae De Leon			5				
Typhodrominae Wainstein							
Metaseiulus (*Metaseiulus*) *camelliae* Chant and Yoshida-Shaul			1				
Silvaseius barretoae Yoshida-Shaul and Chant			1				
Typhlodromus (*Anthoseius*) *transvaalensis* (Nesbitt)			13		1		

*Poaceae species codes: *Cynodon nlemfuensis* (CNL), *Urochloa arrecta* (UAR), *Urochloa brizantha* (UBR), *Urochloa decumbes* (UDE), *Urochloa humidicola* (UHU), *Urochloa plantaginea* (UPL) and *Urochloa ruziziensis* (URU).

Among the 21 species recorded, 11 are new records for Goiás State, and two were collected for the first time since their original descriptions, namely, *Amblyseius atibaiensis* and *Proprioseiopsis biologicus*.

In total, we collected 416 adult phytoseiid mites that were identified at the species level. The most abundant species was *Proprioseiopsis ovatus*, followed by *Neoseiulus benjamini* and *Proprioseiopsis mexicanus*. Only one individual was sampled for *Amblyseius acalyphus*, *Amblyseius compositus*, *Arrenoseius lofegoi*, *Iphiseiodes zuluagai*, *Neoseiulus gracilis*, *Metaseiulus* (*Metaseiulus*) *camelliae* and *Silvaseius barretoae*. Regarding host plants, *U. brizantha* hosted the highest richness and abundance of Phytoseiidae mites, followed by *U. plantaginea* and *U. decumbens* (Table 2). No phytoseiid mites were recorded on *U. lorentziana*. The following is a list of Phytoseiidae species sampled in pastures from livestock farms in Goiás State, Brazil.

Phytoseiidae Berlese

Amblyseiinae Muma

Amblyseius Berlese

Amblyseius acalyphus Denmark & Muma

Amblyseius acalyphus Denmark & Muma 1973: 242.
Amblyseius acalyphus — Moraes *et al.* 1986: 6, 2004: 12; Lofego *et al.* 2024: 9.

Amblyseius (*Amblyseius*) *acalyphus* — Denmark & Muma 1989: 75.

Specimens examined — Itaberaí 1: *Urochloa brizantha*, IV-2023 (1 ♀).

Previous records — Brazil - Goiás, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Roraima, São Paulo; Guadeloupe.

Observation — this species was previously recorded in the state of Goiás on *Bauhinia ungulata* L. (Leguminosae), *Psidium guajava* L. (Myrtaceae), *Schinus terebinthifolius* Raddi (Anacardiaceae), *Brosimum gaudichaudii* Trécul (Moraceae) and *Protium spruceanum* (Bentham) Engler (Burseraceae) (Demite *et al.* 2017).

Amblyseius atibaiensis Mineiro, Lofego & Sato

Amblyseius atibaiensis Mineiro, Lofego & Sato 2012: 596.
Amblyseius atibaiensis — Lofego *et al.* 2024: 15.

Specimens examined — Brazabrantes 2: *Urochloa brizantha*, IV-2023 (6 ♀, 1 ♂). Caturaí 1: *Urochloa brizantha*, IV-2023 (2 ♀, 1 ♂), V-2023 (2 ♀). Inhumas 2: *Urochloa plantaginea*, IV-2023 (4 ♀). Itaberaí 1: *Urochloa brizantha*, IV-2023 (1 ♀, 1 ♂). Nova Veneza 3: *Urochloa brizantha*, III-2023 (1 ♂). Nova Veneza 4: *Urochloa brizantha*, III-2023 (2 ♀), IV-2023 (9 ♀), V-2023 (1 ♀).

Previous records — Brazil - São Paulo.

Observation — *Amblyseius atibaiensis* was first described based on individuals sampled from the soil and litter of coffee crops in São Paulo State, Brazil (Mineiro *et al.* 2012). Here, *A. atibaiensis* is recorded for the first time after its original taxonomy description.

Amblyseius compositus Denmark & Muma

Amblyseius compositus Denmark & Muma 1973: 240.
Amblyseius compositus — Moraes *et al.*, 1986: 11, 2004: 21; Lofego *et al.* 2024: 23.
Amblyseius (*Multiseius*) *compositus* — Denmark & Muma 1989: 95.

Specimens examined — Nova Veneza 4: *Urochloa brizantha*, II-2023 (1 ♀).

Previous records — Brazil - Amazonas, Bahia, Espírito Santo, Goiás, Minas Gerais, Paraná, Pernambuco, Piauí, Rio Grande do Sul, Sergipe, São Paulo, Tocantins.

Observation — this species was previously recorded in Goiás State on *P. guajava*, *S. terebinthifolius*, *Virola sebifera* Fusée-Aublet (Myristicaceae), *Cecropia pachystachya* Trécul (Urticaceae), *Inga edulis* von Martius (Leguminosae), *Protium spruceanum*, Rhamnaceae sp., *Rudgea viburnoides*, *Tocoyena formosa* Schumann (Rubiaceae), *Trichilia martiana* De Candolle (Meliaceae) and an unidentified Myrtaceae species (Demite *et al.* 2017).

Arrenoseius Wainstein

Arrenoseius lofegoi Barbosa & Demite

Arrenoseius lofegoi Barbosa & Demite 2023: 50.
Arrenoseius lofegoi — Lofego *et al.* 2024: 87.

Specimens examined — Nova Veneza 3: *Urochloa brizantha*, IV-2023 (1 ♀).

Previous records — Brazil - Bahia.

Observation — *Arrenoseius lofegoi* was found in sugarcane (*Saccharum officinarum* L., Poaceae) crops in the state of Bahia, Brazil (Barbosa and Demite 2023). *Arrenoseius lofegoi* was previously recorded in Goiás State by Rossetti *et al.* (2025)

Iphiseiodes De Leon

Iphiseiodes zuluagai Denmark & Muma

Iphiseiodes zuluagai Denmark & Muma 1972: 23.

Iphiseiodes zuluagai — Moraes *et al.* 1986: 61; 2004: 91; Lofego *et al.* 2024: 107.
Amblyseius zuluagai — Moraes & Mesa 1988: 79.

Specimens examined — Nova Veneza 4: *Urochloa brizantha*, II-2023 (1 ♀).

Previous records — Brazil - Acre, Alagoas, Amapá, Amazonas, Bahia, Ceará, Distrito Federal, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, Paraná, Paraíba, Pernambuco, Rio de Janeiro, Rio Grande do Norte, Rio Grande do Sul, Rondônia, Roraima, Sergipe, São Paulo, Tocantins; Colombia; Cuba; Dominican Republic; Guadeloupe; Marie Galante; Martinique; Panama; Peru; Puerto Rico; Venezuela.

Observation — previous recorded in Goiás State on *Campomanesia pubescens* (von Martius ex De Candolle) O. Berg (Myrtaceae), *Didymopanax vinosum* (Cham and Schltdl) Marchal (Araliaceae), *Harconia speciosa* Gomes (Apocynaceae), *Xylopia aromatica* (Lamark) von Martius (Annonaceae), *Byrsonima coccolobifolia* Kunth (Malpighiaceae), *Byrsonima intermedia* de Jussieu (Malpighiaceae), *Doliocarpus* cf. *dentatus* (Fusée-Aublet) Standley (Dilleniaceae), *Ouratea spectabilis* von Martius Ex Engler (Ochnaceae), *Annona crassiflora* von Martius (Annonaceae), *Kielmeyera* cf. *coriacea* von Martius and Zucc (Calophyllaceae), *Ouratea spectabilis* (von Martius) Engler (Ochnaceae), *Qualea grandiflora* von Martius (Vochysiaceae), two unidentified species of the Myrtaceae (Rezende and Lofego 2011); *Zeyheria montana* von Martius (Bignoniaceae), *Trichilia martiana* De Candolle (Meliaceae), *Roupala montana* Fusée-Aublet (Proteaceae) (Demite *et al.* 2017), and *Miconia albicans* (Swartz) Steudel (Melastomataceae) (Moraes *et al.* 2022).

Neoseiulus Hughes

Neoseiulus benjamini (Schicha)

Amblyseius benjamini Schicha 1981: 203.
Amblyseius (*Amblyseius*) *benjamini* — Tseng 1983: 60.
Neoseiulus benjamini — Moraes *et al.* 1986: 72, 2004: 108; Lofego *et al.* 2024: 199.

Specimens examined — Brazabrantes 1: *Urochloa brizantha*, I-2023 (1 ♀); *Cynodon nlemfuensis*, IV-2023 (1 ♀). Brazabrantes 2: *Urochloa brizantha*, XI-2022 (1 ♂), I-2023 (1 ♂), III-2023 (1 ♀). Caturaí 1: *Urochloa brizantha*, XI-2022 (1 ♀), XII-2022 (1 ♂), II-2023 (1 ♀, 1 ♂). Caturaí 2: *Urochloa brizantha*, XI-2022 (1 ♀). Inhumas 1: *Urochloa brizantha*, XI-2022 (1 ♂), II-2023 (1 ♂), V-2023 (1 ♀). Inhumas 2: *Urochloa plantaginea*, III-2023 (1 ♀). Itauçu 2: *Urochloa brizantha*, XI-2022 (1 ♀). Nova Veneza 1: *Urochloa brizantha*, XI-2022 (3 ♀), I-2023 (1 ♀), III-2023 (1 ♀), IV-2023 (2 ♀, 1 ♂). Nova Veneza 2: *Urochloa brizantha*, XII-2022 (1 ♀, 1 ♂), I-2023 (1 ♀, 1 ♂). Nova Veneza 3: *Urochloa brizantha*, III-2023 (3 ♀), IV-2023 (3 ♀), V (1 ♀). Nova Veneza 4: *Urochloa brizantha*, XI-2022 (1 ♀), XII-2022 (3 ♀), III-2023 (6 ♀, 3 ♂), IV-2023 (4 ♀, 3 ♂), V-2023 (3 ♀). Nova Veneza 5: *Urochloa brizantha*, XII-2022 (1 ♀), V-2023 (1 ♀); *Urochloa plantaginea*, I-2023 (1 ♀). Itaberaí 1: *Urochloa humidicola*, XI (1 ♀); *Urochloa ruziziensis*, XI-2022 (1 ♀).

Previous records — Australia; Brazil - Bahia, Distrito Federal, Goiás, Mato Grosso do Sul, Minas Gerais, São Paulo, Tocantins; Chile; Martinique; South Africa.

Observation — previous recorded in Goiás on *Trachypogon* sp. (Poaceae) and *Stryphnodendron adstringens* (von Martius) Coville (Fabaceae) (Rezende and Lofego 2011).

Neoseiulus gracilis (Muma)

Cydnodromus gracilis Muma, 1962: 9.
Neoseiulus gracilis — Moraes *et al.* 1986: 81, 2004: 122; Lofego *et al.* 2024: 207.
Neoseiulus atrii (Karg) — (synonymy according to Moraes *et al.* 1997).

Specimens examined — Itauçu 2: *Urochloa brizantha*, XII-2022 (1 ♀).

Previous records — Brazil - Alagoas, Bahia, Paraíba, Pernambuco, Tocantins; Cuba; Saint Lucia, United States of America; Venezuela.

Observation — this is the first record of this species in Goiás State, Brazil.

Neoseiulus paraibensis (Moraes & McMurtry)

Amblyseius paraibensis Moraes & McMurtry 1983: 135.
Neoseiulus paraibensis — Moraes *et al.* 1986: 92, 2004: 137; Lofego *et al.* 2024: 217.

Specimens examined — Caturaí 2: *Urochloa arrecta*, XI-2022 (1 ♀); Nova Veneza 1: *Urochloa brizantha*, XI-2022 (1 ♀, 3 ♂). Nova Veneza 3: *Urochloa brizantha*, XI-2022 (1 ♂).

Previous records — Brazil - Paraná, Paraíba, Rio Grande do Sul, São Paulo; Colômbia; Costa Rica; Cuba; Martinique; Nicaragua; Panama; United States of America.

Observation — here, *N. paraibensis* is recorded for the first time in Goiás State, Brazil.

Neoseiulus transversus Denmark & Muma

Neoseiulus transversus Denmark & Muma 1973: 267.
Neoseiulus transversus — Moraes *et al.* 1986: 98, 2004: 148; Lofego *et al.* 2024: 221.

Specimens examined — Brazabrantes 1: *Urochloa brizantha*, XI-2022 (1 ♀, 1 ♂). Brazabrantes 2: *Urochloa brizantha*, XI-2022 (3 ♀), XII-2022 (1 ♂). Caturaí 1: *Urochloa brizantha*, I-2023 (1 ♀). Itaberaí 1: *Urochloa ruziziensis*, XII-2022 (1 ♀), *Cynodon nlemfuensis*, I-2023 (1 ♀). Itaberaí 2: *Urochloa decumbens*, XI-2022 (1 ♂); *Urochloa humidicola*, XI-2022 (1 ♀). Nova Veneza 3: *Urochloa plantaginea*, XI-2022 (1 ♂), I-2023 (1 ♀). Nova Veneza 4: *Urochloa brizantha*, XII-2022 (1 ♀), I-2023 (1 ♀). Nova Veneza 5: *Urochloa brizantha*, XI-2022 (1 ♀, 1 ♂), XII-2022 (1 ♀, 1 ♂).

Previous records — Argentina; Brazil - Bahia; Goiás; Maranhão; Minas Gerais; Paraíba; Pernambuco, Rio Grande do Sul, São Paulo.

Observation — *Neoseiulus transversus* has been previously recorded in Goiás State on soybean crops (*Glycine max* Merril, Fabaceae) (Cavalcante *et al.* 2017).

Proprioseiopsis Muma

Proprioseiopsis biologicus Lofego, Demite & Moraes

Proprioseiopsis biologicus Lofego, Demite & Moraes, in Lofego *et al.* (2009): 51.
Proprioseiopsis biologicus — Lofego *et al.* 2024: 113.

Specimens examined — Brazabrantes 2: *Urochloa brizantha*, V-2023 (9 ♀). Nova Veneza 1: *Urochloa brizantha*, XI-2022 (2 ♀).

Previous records — Brazil - São Paulo.

Observation — this species was formally described based on specimens collected from *U. decumbens* in São Paulo, Brazil (Lofego *et al.* 2009). This is the first report of *P. biologicus* since its original description.

Proprioseiopsis mexicanus (Garman)

Amblyseiopsis mexicanus Garman 1958: 75.
Typhlodromus (*Amblyseius*) *mexicanus* — Chant 1959: 92.
Amblyseiulus mexicanus — Muma 1961: 278.
Proprioseiopsis mexicanus — Moraes *et al.* 1986: 118, 2004: 181; Lofego *et al.* 2024: 117.
Typhlodromus mexicanus — Hirschmann 1962: 5.
Amblyseius mexicanus — Collyer 1964: 634.
Proprioseiopsis (*Patinoseius*) *mexicanus* — (synonymy according to Karg 1989).
Proprioseiopsis amotus (Zack) — (synonymy according to Denmark & Evans 2011).
Proprioseiopsis asetus (Chant) — (synonymy according to Denmark & Evans 2011).
Proprioseiopsis clausae (Muma) — (synonymy according to Denmark & Evans 2011).
Proprioseiopsis kogi (Chant and Hansell) — (synonymy according to Denmark & Evans 2011).
Proprioseiopsis putmani (Chant) — (synonymy according to Denmark & Evans 2011).

Proprioseiopsis temperellus (Denmark and Muma) — (synonymy according to Denmark & Evans 2011).
Proprioseiopsis tropicanus (Garman) — (synonymy according to Denmark & Evans 2011).
Proprioseiopsis tulearensis (Blommers) — (synonymy according to Denmark & Evans 2011).
Proprioseiopsis versutus (Zack) — (synonymy according to Denmark & Evans 2011).

Specimens examined — Brazabrantes 1: *Urochloa brizantha*, II-2023 (2 ♀); *Cynodon nlemfuensis*, XII-2022 (1 ♀), IV-2023 (1 ♀), V-2023 (1 ♀). Brazabrantes 2: *Urochloa brizantha*, XI-2022 (2 ♀). Caturaí 1: *Urochloa arrecta*, XII-2022 (1 ♀). Caturaí 2: *Urochloa brizantha*, III-2023 (2 ♀), IV-2023 (1 ♀), V-2023 (1 ♀); *Urochloa arrecta*, XI-2022 (1 ♀). Inhumas 1: *Urochloa brizantha*, XII-2022 (1 ♀), III-2023 (3 ♀). Inhumas 1: *Urochloa brizantha*, II-2023 (2 ♀), V-2023 (1 ♀). Inhumas 2: *Urochloa brizantha*, XII-2022 (3 ♀); *Urochloa plantaginea*, III-2023 (4 ♀), V-2023 (4 ♀). Itaberaí 1: *Urochloa brizantha*: II-2023 (1 ♀), V-2023 (4 ♀); *Urochloa decumbens*, I-2023 (1 ♀). Itaberaí 2: *Urochloa humidicola*, XII-2022 (1 ♀), I-2023 (1 ♀), III-2023 (1 ♀), IV-2023 (1 ♀). Itauçu 1: *Urochloa brizantha*, XII-2022 (1 ♀). Itauçu 2: *Urochloa brizantha*, XI-2022 (1 ♀). Nova Veneza 1: *Urochloa brizantha*, III-2023 (5 ♀). Nova Veneza 2: *Urochloa brizantha*, XII-2022 (1 ♀), III-2023 (2 ♀). Nova Veneza 3: *Urochloa brizantha*, IV-2023 (1 ♀), V-2023 (2 ♀). Nova Veneza 4: *Urochloa brizantha*, XII-2022 (1 ♀), IV-2023 (2 ♀), V-2023 (2 ♀). Nova Veneza 5: *Urochloa brizantha*, V-2023 (2 ♀); *Urochloa plantaginea*, III-2023 (1 ♀, 1 ♂).

Previous records — Australia; Benin; Brazil - Alagoas, Bahia, Distrito Federal, Maranhão, Mato Grosso do Sul, Paraná, Paraíba, Pernambuco, Piauí, Rondônia, São Paulo, Tocantins; Canada; China; Colombia; Costa Rica; Cuba; Galapagos; Ghana; Guadeloupe; Hawaii; Ivory Coast; Jamaica; Japan; Kenya; Madagascar; Martinique; Mexico; New Zealand; Nicaragua; Panama; Peru; Reunion Island; Rodrigues Island (Mauritius); Saudi Arabia; Taiwan; United Arab Emirates; United States of America.

Observation — this is the first record of this species in Goiás State, Brazil.

Proprioseiopsis neotropicus (Ehara)

Amblyseius neotropicus Ehara 1966: 133.
Proprioseiopsis neotropicus — Moraes *et al.* 1986: 119, 2004: 183; Lofego *et al.* 2024: 120.

Specimens examined — Nova Veneza 4: *Urochloa brizantha*, IV-2023 (1 ♀), V-2023 (1 ♀).

Previous records — Argentina; Brazil - Alagoas, Amazonas, Bahia, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, Paraná, Paraíba, Pernambuco, Rio Grande do Sul, Roraima, São Paulo; Colombia; Ecuador; French Guiana; Peru.

Observation — this is the first record of this species in Goiás State, Brazil.

Proprioseiopsis ovatus (Garman)

Amblyseiopsis ovatus Garman 1958: 78.
Typhlodromus (*Amblyseius*) *ovatus* — Chant 1959: 90.
Amblyseiulus ovatus — Muma 1961: 278.
Typhlodromus ovatus — Hirschmann 1962: 5.
Amblyseius ovatus — Schuster & Pritchard 1963: 246.
Amblyseius (*Amblyseius*) *ovatus* — Tseng 1983: 42.
Proprioseiopsis ovatus — Tuttle & Muma 1973: 11; Moraes *et al.* 1986: 121, 2004: 151; Lofego *et al.* 2024: 121.
Proprioseiopsis (*Proprioseiopsis*) *ovatus* — Karg 1989: 208.
Proprioseiopsis antonelli Congdon — (synonymy according to Denmark & Evans 2011).
Proprioseiopsis cannaensis (Muma) — (synonymy according to Denmark & Evans 2011).
Proprioseiopsis hundsonianus (Chant and Hansell) — (synonymy according to Denmark & Evans 2011).

Proprioseiopsis parapeltatus Wu and Chou — (synonymy according to Tseng 1983).
Proprioseiopsis peltatus (Van der Merwe) — (synonymy according to Tseng 1983).

Specimens examined — Brazabrantes 1: *Urochloa brizantha*, XI-2022 (1 ♀); *Cynodon nlemfuensis*, IV-2023 (1 ♀). Brazabrantes 2: *Urochloa brizantha*, II-2023 (1 ♀), III-2023 (3 ♀, 1 M), IV-2023 (3 ♀), V-2023 (4 ♀). Caturaí 1: *Urochloa brizantha*, XII-2022 (5 ♀), I-2023 (1 ♀), III-2023 (8 ♀, 2 ♂), IV-2023 (7 ♀, 1 ♂), V-2023 (7 ♀, 4 ♂). Caturaí 2: *Urochloa arrecta*, XI-2022 (1 ♀). Inhumas 1: *Urochloa brizantha*, XI-2022 (1 ♀), XII-2022 (1 ♀), IV-2023 (1 ♀), V-2023 (1 ♀). Inhumas 2: *Urochloa plantaginea*, III-2023 (4 ♀), V-2023 (7 ♀). Itaberaí 1: *Urochloa brizantha*, XII-2022 (2 ♀), IV-2023 (1 ♀), V-2023 (1 ♀). Itaberaí 2: *Urochloa humidicola*, I-2023 (1 ♀), IV-2023 (1 ♀), V-2023 (1 ♀). Itauçu 1: *Urochloa brizantha*, XII-2022 (1 ♀). Nova Veneza 1: *Urochloa brizantha*, XII-2022 (1 ♀), II-2023 (10 ♀), IV-2023 (2 ♀), V-2023 (1 ♀). Nova Veneza 2: *Urochloa brizantha*, XII-2022 (2 ♀), IV-2023 (19 ♀), V-2023 (18 ♀, 3 ♂). Nova Veneza 3: *Urochloa brizantha*, XI-2022 (1 ♀), III-2023 (2 ♀), IV-2023 (17 ♀). Nova Veneza 4: *Urochloa brizantha*, XI-2022 (1 ♀), III-2023 (12 ♀), IV-2023 (1 ♀, 1 ♂), V-2023 (2 ♀); *Urochloa arrecta*, XI-2022 (1 ♀). Nova Veneza 5: *Urochloa plantaginea*, I-2023 (1 ♀), III-2023 (1 ♀), IV-2023 (4 ♀), V-2023 (1 ♀).

Previous records — Argentina; Australia; Brazil - Alagoas, Bahia, Distrito Federal, Goiás, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, Paraná, Rio Grande do Sul, São Paulo; Canada; China; Colombia; Costa Rica; Cuba; DR Congo; Ecuador; Egypt; El Salvador; Fiji; French Guiana; Ghana; Grande Comore Island (Comoros); Guadeloupe; Guyana; Hawaii; Honduras; India; Ivory Coast; Japan; Lesotho; Madagascar; Malaysia; Malawi; Marie Galante; Martinique; Mayotte Island; Mozambique; New Caledonia; Papua New Guinea; Paraguay; Peru; Philippines; Puerto Rico; Reunion Island; Saudi Arabia; Sierra Leone; South Africa; Spain; Sri Lanka; Taiwan; Thailand; Turkey; United States of America; Venezuela; Zimbabwe.

Observation — *Proprioseiopsis ovatus* has been previously recorded on *Psidium guineense* Swartz (Myrtaceae) and *Guapira noxia* (Netto) Lundell (Nyctaginaceae) in the state of Goiás (Demite *et al.* 2017).

Proprioseiopsis pentagonalis (Moraes & Mesa)

Amblyseius pentagonalis Moraes & Mesa, in Moraes *et al.* (1991): 127.
Proprioseiopsis pentagonalis — Moraes *et al.* 2004: 186; Lofego *et al.* 2024: 124.

Specimens examined — Inhumas 2: *Urochloa brizantha*, V-2023 (5 ♀); *Urochloa plantaginea* (Poaceae), V-2023 (3 ♀). Nova Veneza 3: *Urochloa brizantha*, IV-2023 (3 ♀).

Previous records — Brazil - Amazonas, Bahia, Maranhão, Piauí, São Paulo; Colombia; Guadeloupe.

Observation — this is the first record of this species in Goiás State, Brazil.

Typhlodromalus Muma

Typhlodromalus aripo De Leon

Amblyseius aripo De Leon 1967: 21.
Typhlodromalus aripo — Moraes & McMurtry 1983: 132; Moraes *et al.* 1986: 128, 2004: 195. Lofego *et al.* 2024: 169.

Specimens examined — Nova Veneza 1: *Urochloa brizantha*, II-2023 (1 ♀). Nova Veneza 4: *Urochloa brizantha*, II-2023 (1 ♂).

Previous records — Argentina; Benin; Brazil - Alagoas, Amazonas, Bahia, Ceará, Distrito Federal, Espírito Santo, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, Paraná, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, Rio Grande do Sul, Santa Catarina, Sergipe, São Paulo, Tocantins; Cameroon; Colombia; Congo; Costa Rica; El Salvador; Guadeloupe; Guyana; Jamaica; Kenya; Malawi; Mexico; Mozambique; Paraguay; Peru; Trinidad; Uganda.

Observation — *Typhlodromalus aripo* has previously been recorded in Goiás State on *Virola sebifera* Fusée-Aublet (Myristicaceae), *Vernonanthura* sp. (Compositae), *Luehea divaricata* von Martius (Malvaceae), *Cecropia pachystachya* Trécul (Urticaceae), *Zeyheria montana* von Martius (Bignoniaceae), *Magonia pubescens* de Saint-Hilaire (Sapindaceae), *Schefflera macrocarpa* (von Chamisso and von Schlechtendal) Frodin (Araliaceae), *Tibouchina* sp. (Melastomataceae) and unidentified species of Rubiaceae and Malpighiaceae (Demite *et al.* 2017).

Typhlodromalus clavicus Denmark & Muma

Typhlodromalus clavicus Denmark & Muma 1973: 257.
Typhlodromalus simus — Moraes *et al.* 1986: 134, 2004: 204; Lofego *et al.* 2024: 171.

Specimens examined — Brazabrantes 1: *Cynodon nlemfuensis*, V-2023 (1 ♀).
Previous records — Brazil - São Paulo, Tocantins; El Salvador; Honduras.
Observation — this is the first record of this species in Goiás State, Brazil.

Typhlodromalus peregrinus Muma

*Typhlodromus peregrinus*Mum a 1955: 270.
Typhlodromalus peregrinus — Moraes *et al.* 1986: 132, 2004: 202; Lofego *et al.* 2024: 176.
Typhlodromus (*Typhlodromopsis*) *peregrinus* — De Leon 1959: 114.
Typhlodromus (*Amblyseius*) *peregrinus* — Chant 1959: 97.
Amblyseius (*Typhlodromalus*) *peregrinus* — Muma 1961: 288.
Amblyseius peregrinus — Muma and Denmark 1962: 60.
Amblyseius (*Amblyseius*) *peregrinus* — Van der Merwe 1968: 113.
Typhlodromalus evansi (Chant) — (synonymy according to Muma 1964).
Typhlodromalus primulae (Chant) — (synonymy according to Muma 1964).
Typhlodromalus robiniae (Chant) — (synonymy according to Muma 1964).
Typhlodromalus sextus (Garman, 1958) — (synonymy according to Denmark & Evans 2011).

Examined material — Nova Veneza 3: *Urochloa plantaginea*, XI-2022 (1 ♀). Nova Veneza 4: *Urochloa brizantha*, II-2023 (2 ♀);
Previous records — Argentina; Brazil - Acre, Alagoas, Amazonas, Bahia, Ceará, Goiás, Mato Grosso, Paraíba, Pernambuco, Rio de Janeiro, Rio Grande do Norte, Rio Grande do Sul, Sergipe, São Paulo, Tocantins; Colombia; Costa Rica; Cuba; Dominican Republic; Ecuador; Guadeloupe; Guatemala; Guyana; Hawaii; Honduras; Martinique; Mexico; Nicaragua; Peru; Puerto Rico; Suriname; United States of America; Venezuela.
Observation — *Typhlodromalus peregrinus* has previously been recorded on *Protium spruceanum* (Bentham) Engler (Burseraceae) in Goiás State (Demite *et al.* 2017).

Typhlodromips De Leon

Typhlodromips mangleae De Leon

Typhlodromips mangleae De Leon 1967: 28.
Typhlodromips mangleaem — Moraes *et al.*, 1986: 143, 2004: 217; Lofego *et al* 2024: 251.
Amblyseius mangleae — Moraes & Mesa 1988: 75.

Specimens examined — Brazabrantes 1: *Urochloa brizantha*, (1 ♀). Nova Veneza 2: *Urochloa brizantha*, V-2023 (1 ♀). Nova Veneza 4: *Urochloa brizantha*, II-2023 (1 ♀), III-2023 (1 ♀), V-2023 (1 ♀).
Previous records — Brazil - Alagoas, Bahia, Ceará, Distrito Federal, Maranhão, Mato Grosso do Sul, Minas Gerais, Pará, Paraná, Pernambuco, Rio Grande do Sul, São Paulo, Tocantins; Colombia; Peru; Puerto Rico; Trindad.
Observation — this is the first record of this species in Goiás State, Brazil.

Typhlodrominae Wainstein

Metaseiulus Muma

Metaseiulus (*Metaseiulus*) *camelliae* (Chant & Yoshida-Shaul)

Typhlodromus camelliae Chant & Yoshida-Shaul 1983: 1053.
Typhlodromina camelliae — Moraes *et al.* 1986: 236.
Metaseiulus (*Metaseiulus*) *camelliae* — Moraes *et al.* 2004: 278.
Metaseiulus camelliae — Bellini *et al.* 2005 479.

Specimens examined — Itauçu 2: *Urochloa brizantha*, XII-2022 (1 ♀).
Previous records — Argentina; Brazil - Minas Gerais, Rio Grande do Sul, Santa Catarina, São Paulo; Chile; Uruguay.
Observation — this is the first record of *M.* (*M.*) *camelliae* in Goiás State.

Silvaseius Chant & McMurtry

Silvaseius barretoae Yoshida-Shaul & Chant

Cydnodromella barretoae Yoshida-Shaul & Chant 1991: 93.
Silvaseius barretoae — Chant & McMurtry 1994: 241; Moraes *et al.* 2004: 304.

Specimens examined — Itaberaí 1: *Urochloa brizantha*, IV-2023 (1 ♀).
Previous records — Argentina; Brazil - Mato Grosso, São Paulo; Costa Rica.
Observation — this is the first record of this species in Goiás State, Brazil.

Typhlodromus Scheuten

Typhlodromus (*Anthoseius*) *transvaalensis* (Nesbitt)

Kampimodromus transvaalensis Nesbitt 1951: 55.
Typhlodromus (*Typhlodromus*) *transvaalensis* — Chant 1959: 60.
Neoseiulus transvaalensis — Muma 1961: 295.
Typhlodromus (*Neoseiulus*) *transvaalensis* — Pritchard & Baker 1962: 222.
Mumaseius transvaalensis — Abbasova 1970: 1410.
Clavidromus transvaalensis — Muma & Denmark 1971: 238; Moraes *et al.* 1986: 182.
Anthoseius (*Anthoseius*) *transvaalensis* — Wainstein & Vartapetov 1973: 104.
Anthoseius transvaalensis — Beglyarov 1981: 21.
Typhlodromus (*Anthoseius*) *transvaalensis* — Chant & McMurtry 1994: 252; Moraes *et al.* 2004: 355.
Anthoseius (*Clavidromus*) *transvaalensis* — Kolodochka 2006: 145.
Typhlodromus (*Anthoseius*) *jackmickleyi* De Leon — (synonymy according to Muma & Denmark 1968).
Typhlodromus (*Anthoseius*) *pectinatus* Athias-Henriot — (synonymy according to Muma & Denmark 1968).

Specimens examined — Caturaí 1: *Urochloa brizantha*, XII-2022 (2 ♀). Inhumas: *Urochloa brizantha*, XII-2022 (1 ♀). Nova Veneza 1: *Urochloa brizantha*, III-2023 (1 ♀). Nova Veneza 2: *Urochloa brizantha*, I-2023 (1 ♀). Nova Veneza 3: *Urochloa brizantha*, XII-2022 (1 ♀), III-2023 (6 ♀). Itaberaí 1: *Urochloa brizantha*, IV (1 ♀). Itaberaí 2: *Urochloa humidicola*, XII-2022 (1 ♀).
Previous records — Algeria; Anjouan Island; Argentina; Australia; Queensland; Azerbaijan; Brazil - Amazonas, Bahia, Mato Grosso, Pará, Paraná, Pernambuco, Rio Grande do Sul, São Paulo, Tocantins; Cameroon; Cape Verde; China; Colombia; Costa Rica; Cuba; Egypt; Georgia; Guinea; Hawaii; India; Indonesia; Iran; Israel; Italy; Japan; Jordan; Kenya; Mexico; New Caledonia; Panama; Peru; Philippines; Reunion Island; Singapore; South Africa; Spain; Taiwan; United States of America.

Observation — *Typhlodromus* (*Anthoseius*) *transvaalensis* was previously recorded in Goiás State by Rossetti *et al.* (2025).

Discussion

The grass species used for pastures in Goiás State act as reservoirs for predatory mites. In the present study, 21 Phytoseiidae species were recorded in pastures used for livestock. These results were similar to the findings of Lofego *et al.* (2009), which in turn, reported 21 phytoseiid mites on grasses of the species *U. decumbens*, *U. brizantha*, *U. ruziziensis*, *Melinis minutiflora*, *Urochloa lorentziana*, and *Pennisetum purpureum* in São Paulo State. Previous studies on native plants in the Cerrado recorded 34 species of Phytoseiidae (Demite *et al.* 2017), while another survey reported 26 species of mites from the same family (Rezende and Lofego 2011). In the Pantanal biome, Mendonça *et al.* (2019) reported 35 Phytoseiidae species associated with native trees. Additionally, collections carried out in the Cerrado, Pantanal, and Amazon Forest recorded nine, 16, and 11 species, respectively (Conceição *et al.* 2021), while another sampling in the same biomes recorded five, five, and 17 phytoseiid species, respectively (Demite *et al.* 2021). Rossetti *et al.* (2025) recorded 19 phytoseiid species in remnants of Cerrado vegetation in the state of Goiás. Thus, pasture areas, although simplified ecosystems, can exhibit considerable diversity when compared to natural vegetation remnants.

Among Phytoseiidae species sampled, only *I. zuluagai*, *N. benjamini*, *P. mexicanus* and *P. biologicus* have been previously reported in Brazilian grasslands (Lofego *et al.* 2009). For the remaining species, this study provides the first record in Brazilian pasture crops. *Proprioseiopsis ovata* was the most abundant species in the evaluated pastures. Species from this genus are widely used in natural biological control. For example, *P. mexicanus*, the third most abundant phytoseiid species sampled here, is a generalist predator with the potential to control arthropod pests (Yuan *et al.*, 2025). *Proprioseiopsis mexicanus* has also been recorded at high abundances during the wet season (Mailloux *et al.* 2010). *Neoseiulus benjamini* was the second most abundant species in pastures from livestock farms in Goiás State. This species was previously reported on monocotyledonous plants from the families Poaceae and Cyperaceae (Demite *et al.* 2017; Ferragut and Navia 2022).

Our results showed that Poaceae crops support a rich assemblage of Phytoseiidae species. Therefore, assessing the biodiversity in pastures is essential for crop management, as these grass species are widely used for soil cover in Brazilian agroecosystems (Flechtmann 2004; Aguilar-Fenollosa *et al.* 2011; Blanco-Pérez *et al.* 2020). These results highlights the importance of avoiding farm management practices that affect predator populations (Farfan *et al.* 2021). However, more studies are necessary to increase our knowledge of the biodiversity associated with pasture crops and the interactions between mites and grasses.

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