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A new species of *Lyssomanes* Hentz 1845 (Araneae: Salticidae: Lyssomaninae) from the Central Cerrado of Brazil

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Abstract. Jumping spiders (Salticidae) comprise one of the most diverse groups of spiders. As part of a study of salticid spiders in the Central-Western Region, Brazil, a new species of the salticid genus *Lyssomanes* Hentz, 1845 is described as *L. florenciae* sp. n. The known distribution of the species *L. camacanensis* Galiano 1980, *L. longipes* (Taczanowski 1871), and *L. pauper* Mello-Leitão 1945 is extended to include the state of Goias. An updated map of the known distribution of *Lyssomanes* in Brazil includes both new and previously published records.

Keywords. Goias, *Lyssomanes camacanensis*, *Lyssomanes florenciae*, *Lyssomanes longipes*, *Lyssomanes pauper*, microhabitat, Neotropical, taxonomy, zoogeography

Introduction

Jumping spiders of the subfamily Lyssomaninae comprise a group of divergent salticids (Galiano 1980; Logunov 2014; Madison 2015, 2016). This subfamily includes three genera: *Chinoscopus* Simon 1900, *Lyssomanes* Hentz 1845, and *Sumakuru* Maddison, 2016 (Metzner 2022; World Spider Catalog 2022). *Lyssomanes* is a large Neotropical genus, currently represented by 94 valid species, including some fossil species from Dominican Amber (Wunderlich 1986, 1988; Logunov 2014; Dunlop et al. 2020).

Lyssomanes is widely distributed from the United States to Argentina (World Spider Catalog 2022). In Brazil, it is represented by 46 species distributed across six terrestrial biomes (Galiano 1980, 1996; Logunov 2000, 2002, 2014; Galvis 2018; World Spider Catalog 2022). The Cerrado biome has 11 phytophysiognomies divided into forest, savanna, and grassland formations; each type of phytophysiognomy presents specific characteristics of the vegetation structure (Ribeiro & Walter 1998). Due to such varied plant formations, the Cerrado is a biodiversity hotspot with more than 4800 plants and vertebrates found nowhere else, but only 46% of its native vegetation and less than 19.8% remains conserved (Klink & Machado 2005; Strassburg et al. 2017).

Here I describe a new species, *Lyssomanes florenciae* n. sp., collected in the Brazilian central Cerrado. Additionally, new faunal records for the state of Goias, with ecological comments and distribution maps, are intended to serve as a basis for the design of further investigations to support the development of conservation plans, monitoring, and conservation policies for this group of spiders in the Brazilian Cerrado.

Materials and Methods

The examined specimens are deposited in the arachnological collection of the Laboratory of Behavioral Ecology of Arachnids (LECA), at the State University of Goias, Anápolis, Goias, Brazil. The epigynum was dissected as in Levi (1965), treated with 10% of Lactic Acid to digest soft tissue, and then cleared in clove oil. Multifocal photographs of the genitalia were taken at the Laboratory of Behavioral Ecology of Arachnids (LECA) of the State University of Goias, Anápolis, Goias, Brazil, with an HD digital camera attached to a Carl Zeiss stereomicroscope, Axiostar, and then composited with the image stacking software AxioVision Carl Zeiss SE64 (Rel. 4.9.1. SP2). Measurements in millimeters were taken using an attached micrometer, in conjunction with software AxioVision Carl Zeiss SE64 (Rel. 4.9.1. SP2). Measurements follow Galiano (1963), except PMEP that follows Edwards (2004).

Abbreviations used in the text and figures. **ALE,** anterior lateral eyes; **AME,** anteromedian eyes; **cd,** copulatory duct; **co,** copulatory opening; **d,** dorsal; **di,** distal; **fd,** fertilization duct; **OC,** ocular quadrangle; **p,** prolateral; **PLE,** posterolateral eyes; **PME,** posteromedian eyes; **pr,** proximal; **r,** retrolateral; **sp,** spermatheca; **Ca,** carina; **PT,** prolateral tooth; **RT,** retrolateral tooth; **Go,** gonopore, **ID,** insemination duct; **FD,** fertilization duct; **Sp,** spermatheca; **Fo,** fossa.

Taxonomy

Family Salticidae Blackwall 1841
Subfamily Lyssomaninae Blackwall 1877

Lyssomanes Hentz 1845

Type species: *Lyssomanes viridis* (Walckenaer 1837): Hentz, 1845, p. 198, p. 17, fig. 3

Diagnosis. Jumping spiders of the genus *Lyssomanes* Hentz 1845 can be easily distinguished from the genus *Chinoscopus* Simon 1901 by the third row of eyes which is much narrower than the fourth row, and from the genus *Sumakuru* Maddison 2016 by the male pedipalp, with a smoothly arching embolus connected to the tegulum by a thin sclerite and a twisted hematodocha (Galiano 1980; Logunov 2014; Madison 2016).

Lyssomanes camacanensis Galiano 1980

Material examined. 1♂ Brazil, Goias, Anapolis: Reserva Ecológica e Cientifica Trilha do Tatu [16°23'1.79"S, 48°56'39.35"W], [1081 m], 29-X-2019, dry forest, agitation of foliage, E. Bedoya-Roqueme, R. F. Ribeiro col. (LECA; MG-14).

Distribution. Brazil.

Lyssomanes florenciae, sp. n.

(Figures 1–20)

Material examined. Holotype: 1♀ Brazil, Goias, Anapolis: Reserva Ecológica e Cientifica Trilha do Tatu [16°23'2.69"S, 48°56'39.36"W], [1075 m], October 15, 2019, dry forest, agitation of foliage, E. Bedoya-Roqueme, R. F. Ribeiro col. (LECA; A2 B2-3, CE B1-3). Paratypes: 2 ♀ Brazil, Goias, Anapolis: Reserva Ecológica e Cientifica Trilha do Tatu [16°23'2.79"S, 48°56'38.25"W], [1070m], October 29, 2019, dry forest, agitation of foliage, E. Bedoya-Roqueme, R. F. Ribeiro col. (LECA; A2 B2-3, CE B1-3). All types are

deposited in the arachnological collection of the Laboratory of Behavioral Ecology of Arachnids (LECA), at the State University of Goias, Anápolis, Goias, Brazil.

Etymology. The species group name *florenciae* (gen.) is given to honor the arachnologist Lic. María Florencia Nadal who first taught me how to identify specimens of the family Salticidae.

Diagnosis. *Lyssomanes florenciae* is similar to *L. similis* Logunov 2014, but can be easily distinguished from that species by the arrangement of the insemination ducts and the shape of the receptacles.

Description of female, based on the female holotype (LECA; A2 B2-3, CE B1-3). Color in alcohol: body pale yellow (Figures 1–3), with scattered orange scales on ALE and PME, with few white hairs scattered throughout the carapace, becoming more visible near the PLE (Figures 7–8), light-yellow endites and labium with slightly sclerotized edges (Figures 9–10), pale yellow sternum, all legs uniformly light-yellow, metatarsus and tarsus a little darker, abdomen dorsum and sides with scattered dark hairs (Figures 1–3), especially in the anterior part, clear ventral area, especially the region of the book lungs, where it is whitish, light-orange sclerotized epigynum (Figures 1–3).

Cephalothorax wider than long (Figure 4), the ALE, PME, and PLE on dark-colored tubercules (Figure 4), surrounded by intense orange scales, and scattered white hairs (Figure 7), the AME surrounded by orange scales (Figure 8), with evident thoracic lines and a straight posterior margin (Figure 9); sternum octagonal in shape (Figure 10). Chelicerae are light-yellow and vertical, with two large teeth on the prolateral margin and a conspicuous small tooth on the medial prolateral margin (Figures 11, 14), five teeth on the retrolateral margin, which decrease in size, and a small conspicuous sixth tooth near the medial retrolateral margin (Figures 12–13, 15–16).

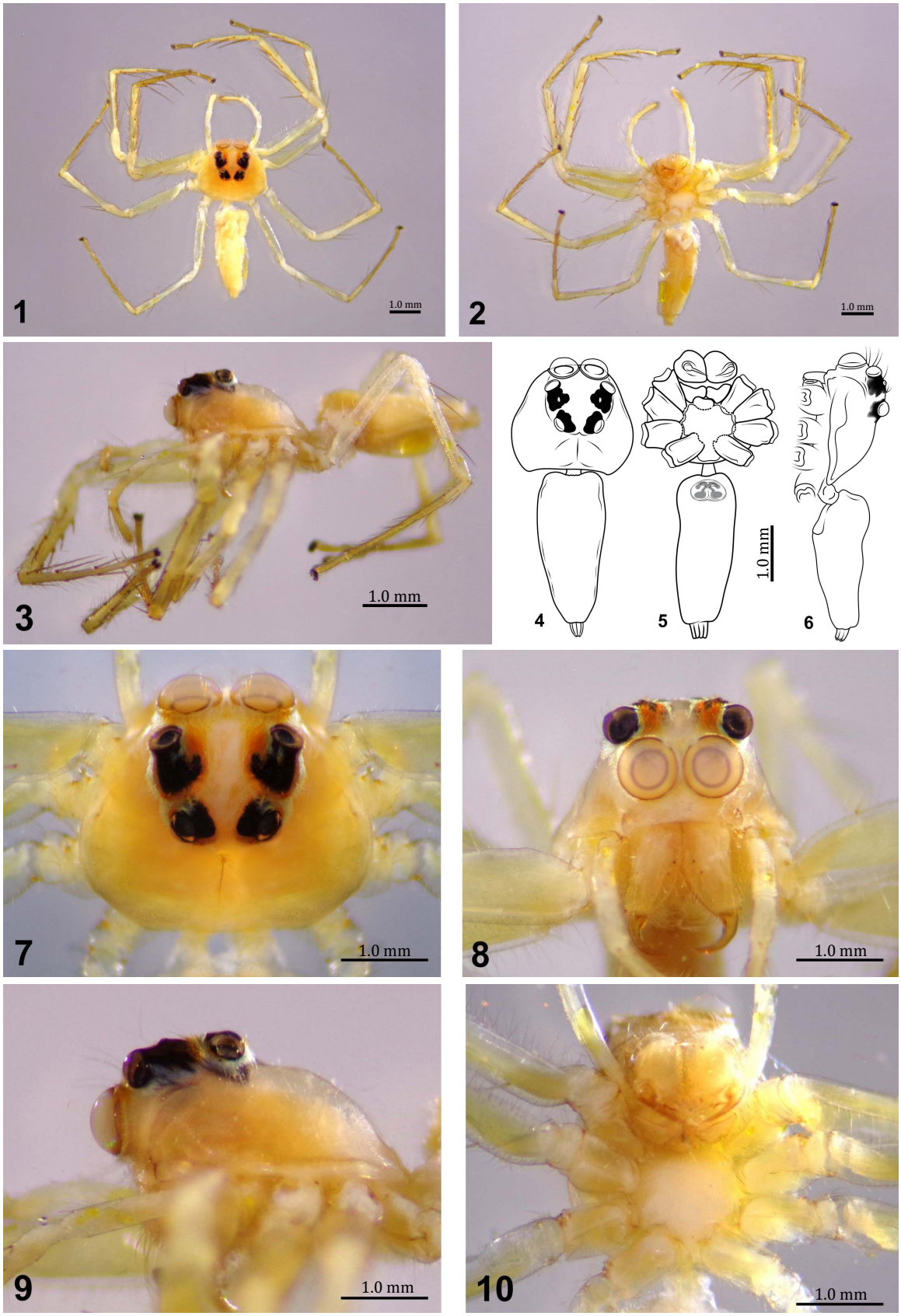
Abdomen elongated, with scattered dark hairs (Figures 2–3), abundant on the anterior margin, with some evident depressions (Figures 5–6). The epigynum is sclerotized, reddish-brown, oval, with a clear aperture, gonopores on both sides (*Go*, Figures 17, 19); connected directly to a fossa (*Fo*, Figures 17, 19), where the copulatory ducts begin. These ducts immediately curve, and then connect directly to the spermathecae (*Sp*, Figures 18, 20), culminating in the fertilization ducts (Figures 18, 20).

Spination: Leg I: F= d 1*-2-2-2, r1-1-0; P= d 0-1r; T= d 0-0-2, v 2-2-2-2; M= v 2-2-2. Leg II: F= d 0-2-2, r1-1-0; P= d 0-1; T= d 0-2, v 2-2-2; M= v 2-2-2. Leg III: F=d 0-2—2, r 1-1-1; P= d 0-1; T= d 0-1-1, r1-1, p1; M= v 0-2-2, d 0-0-1.

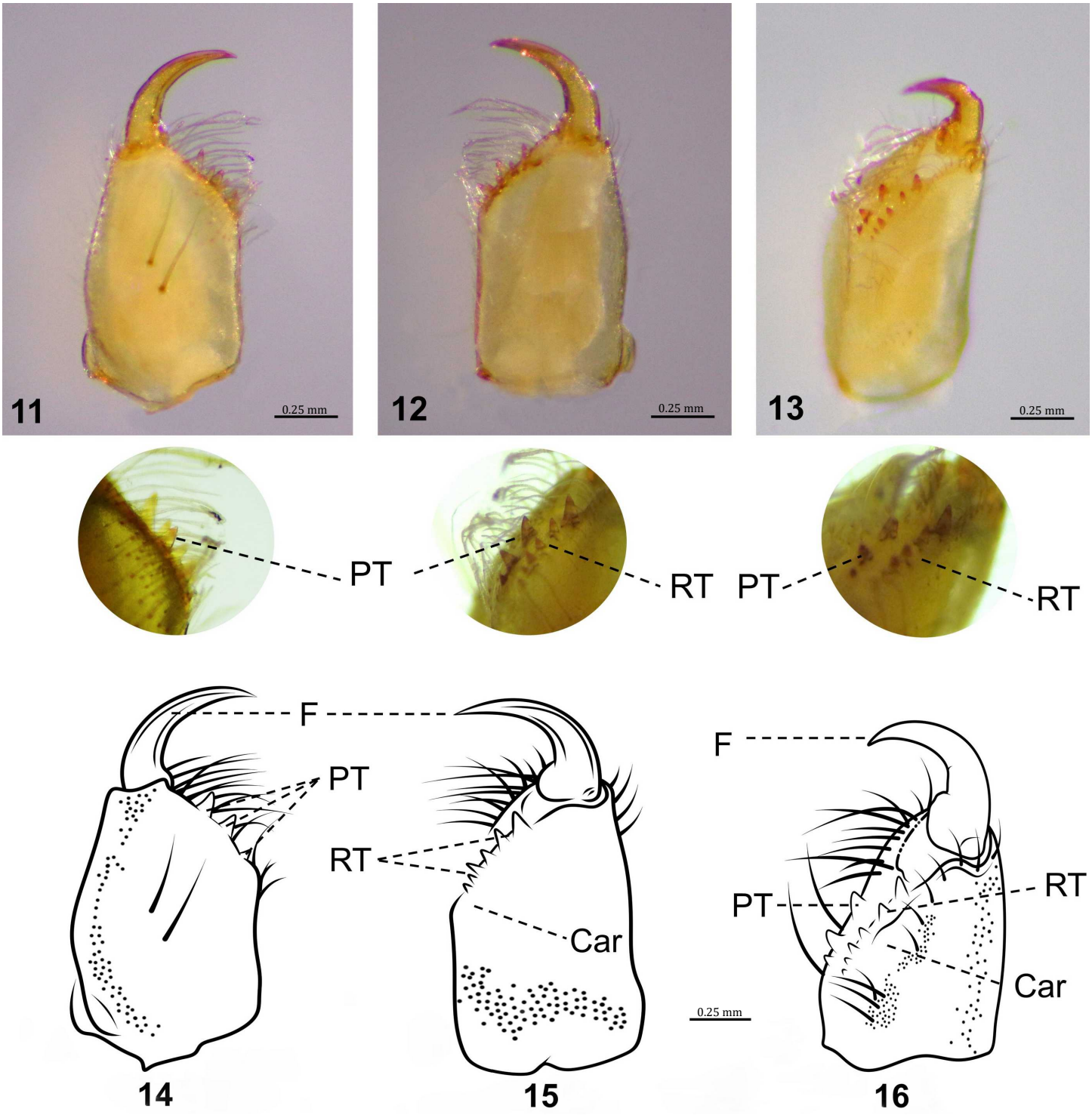
Measurements for three females: TL= 4.83–4.91; CL= 1.92-1.97; CW= 2.13–2.15; AL= 2.83–2.85; AERW= 1.14–1.16; PERW= 0.89–0.91; LOQ= 1.37–1.39; PMEP= 0.35–0.37; eyes of the second row separated from the ALE by 0.14–0.16 mm and from the PLE by 0.26–0.28 mm. Legs: F: I= 2.59–2.60/0.46–0.48, II= 2.35–2.40/0.44–0.46, III= 2.14–2.16/0.41–0.43, IV= 2.08–2.12/0.30–0.31; P: I= 0.89–0.90/0.37–0.39, II= 0.89–0.90/0.32–0.34, III= 0.78–0.80/0.34–0.36, IV= 0.66–0.68/0.27–0.29; Ti: I= 2.31-2.33, II= 2.08–2.10, III= 2.23–2.25, IV= 2.18–2.20; M: I=2.25–2.27, II= 2.11–2.13, III= 2.28–2.30, IV= 2.372.39; Ta: I= 0.63–0.65, II= 0.63–0.65, III= 0.65–0.67, IV= 0.65–0.67.

Male unknown.

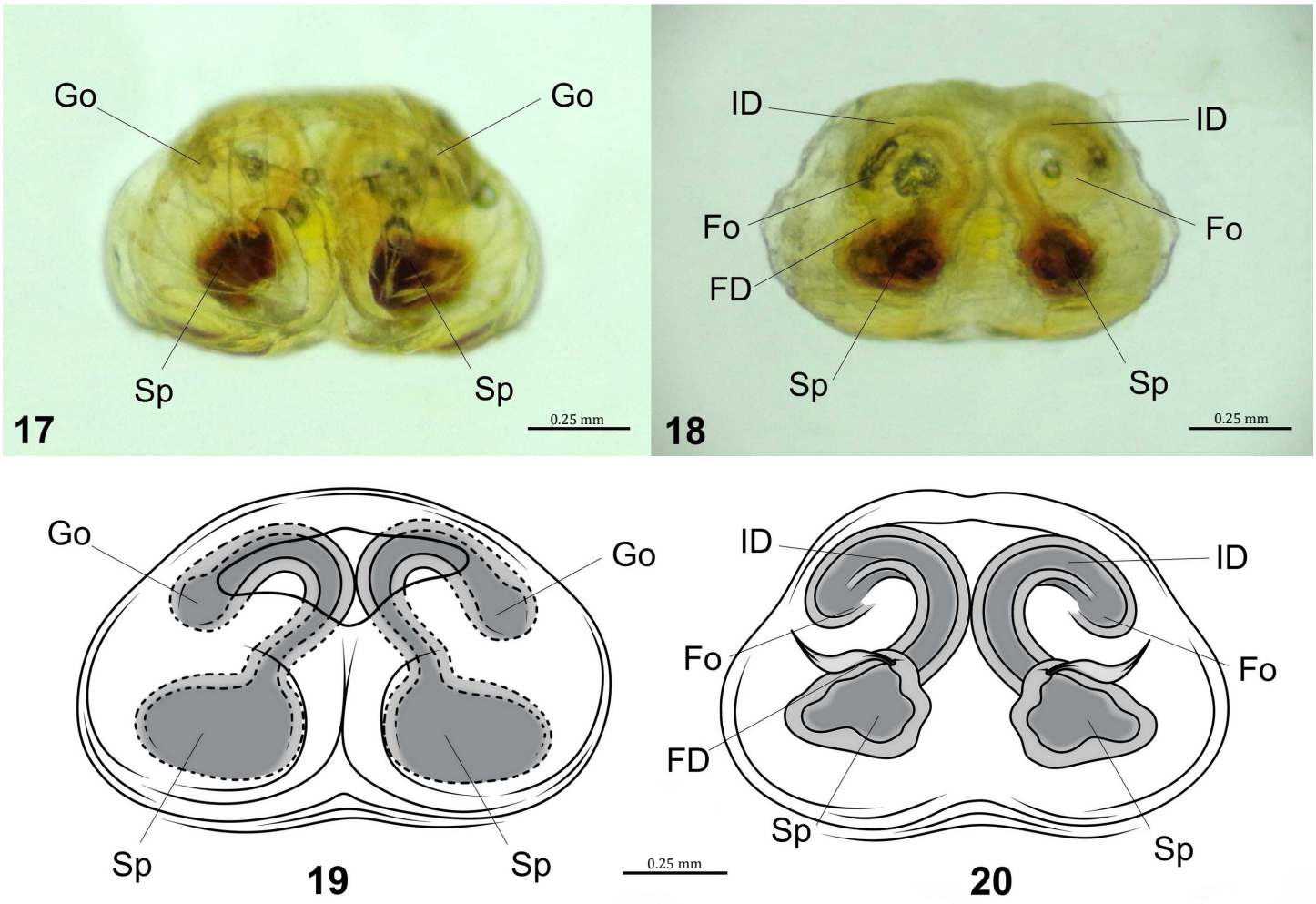
Distribution. Only known from the type locality (Reserva Ecologica e Cientifica Trilha do Tatu, Anápolis, Goias, Brazil) (Table 1, Figures 21-23).



Figures 1-10. *Lyssomanes florenciae*, sp. n., female holotype (LECA; A2 B2-3, CE B1-3). **1-3,** Habitus of specimen in alcohol, dorsal (1), ventral (2) and lateral (3) views. **4-6,** Habitus, dorsal (4), ventral (5) and lateral (6) views. **7-10,** Prosoma of specimen in alcohol, dorsal (7), anterior (8), lateral (9) and ventral (10) views.



Figures 11-16. Left chelicera of *Lyssomanes florenciae*, sp. n., female holotype (LECA; A2 B2-3, CE B1-3). **11-13,** Anterior (11), posterior (12), and oblique disto-posterior (13) views of specimen in alcohol, with details of promarginal teeth (*PT*) and retromarginal teeth (*RT*). **14-16,** Anterior, posterior, and oblique disto-posterior views, with the fang (*F*) and carina of the paturon (*Ca*) identified.



Figures 17-20. Epigynum of *Lyssomanes florenciae*, sp. n., female holotype (LECA; A2 B2-3, CE B1-3). **17-18,** Ventral (18) and dorsal (19) views of dissected epigynum in alcohol. **19-20,** Ventral (19) and dorsal (20) views. Abbreviations: **FD**, fertilization duct; **Fo,** fossa; **Go,** gonopore; **ID,** insemination duct; **Sp,** spermatheca.

Figures 21-22. Habitat of record for *Lyssomanes florenciae*, sp. n. in the Brazilian Cerrado. **21,** Cerrado *sensu strictu*. **22,** Dry forest.

Lyssomanes longipes (Taczanowski 1871)

Material examined. 1♂ Brazil, Goias, Anapolis: Reserva Ecológica e Cientifica Trilha do Tatu [16°23'1.79"S, 48°56'39.35"W], [1081 m], 29-X-2019, dry forest, agitation of foliage, E. Bedoya-Roqueme, R. F. Ribeiro col. (LECA; FL-MS).

Distribution. Brazil, French Guiana, Guyana, Honduras, Venezuela.

Lyssomanes pauper Mello-Leitão 1945

Material examined. 1♀ Brazil, Goias, Anapolis: Reserva Ecológica e Cientifica Trilha do Tatu [16°23'1.79"S, 48°56'39.35"W], [1081 m], 29-X-2019, dry forest, agitation of foliage, E. Bedoya-Roqueme, R. F. Ribeiro col. (LECA; MSB1-2). 2♀ Brazil, Goias, Anapolis: Reserva Ecológica e Cientifica Trilha do Tatu [16°23'1.79"S, 48°56'38.78"W], [1075m], 5-XI-2019, dry forest, agitation of foliage, E. Bedoya-Roqueme, R. F. Ribeiro col. (LECA; MSB1-2, A2B1-4).

Distribution. Argentina, Brazil.

Ecological comments

In the Brazilian Cerrado, the species *Lyssomanes camacanensis*, *L. florenciae* sp. n., *L. longipes*, and *L. pauper* were collected in the phytophysiographic provinces of Cerrado *sensu strictu* and Dry Forest, in the central Brazilian Cerrado, during daylight hours, associated with the shrub stratum of this vegetation (Figures 21–22). Other *Lyssomanes* species can be found inside these forests, apparently in relatively open places, or even in urban environments, generally on plants with large, broad leaves, and sometimes sharing the same microhabitat with other species (Logunov 2002, 2014; Rubio et al. 2018; Galvis 2018, 2020).

Table 1 (continued on next page). Published records of the distribution of *Lyssomanes* species that have been recorded in Brazil. Of 47 species, 18 are known from a single sex. Reference numbers (*ref.*) correspond to localities shown on the map, Figure 23.

ref.	species	authority	♂♀	locality	reference
1	*L. adisi*	Logunov 2002	♂♀	Ilha de Curari, Manaus	Logunov 2002
				Igapó, Tarumã-Mirim, Manaus	Logunov 2002
2	*L. amazonicus*	Peckham, Peckham & Wheeler 1889	♂♀	Amazon	Peckham, Peckham & Wheeler 1889
				Igapó, Tarumã-Mirim, Manaus	Logunov 2002
				Paraná do Xiboreninho Manaus	Logunov 2002
				Reserva Extrativista de Catuaba, Rio Branco, Acre	Logunov 2002
				Pimenteira, Xapurí, Acre	Logunov 2002
3	*L. austerus*	Peckham, Peckham & Wheeler 1889	♂♀	near Rio de Janeiro	Peckham, Peckham & Wheeler 1889
4	*L. benderi*	Logunov 2002	♂♀	Lago Janauari, Manaus	Logunov 2002
				Ilha de Curari, Manaus	Logunov 2002
				Maravilha, Porto Velho, Rondônia	*L. pseudobenderi* Logunov 2002
5	*L. bitaeniatus*	Peckham, Peckham & Wheeler 1889	♂♀	Ceará; Salto da Alegria, Paranatinga, Mato Grosso; Pernambuco, Tapera	Galiano 1980
6	*L. boraceia*	Galiano 1984	♀	Boraceia, Estado de São Paulo	Galiano 1984
7	*L. camacanensis*	Galiano 1980	♂♀	Brasil, Bahía State, Camacán, Fazenda Santa Ursula; Itamarajú; Paraná: Foz do Chopim, Cruzeiro do Iguaçu, Dois Vizinhos, Paraná	Galiano 1980; Logunov 2002
8	*L. ceplaci*	Galiano 1980	♂♀	Bahia State: Una, Reserva Biológica do Una; Pará: Belém	Galiano 1980
9	*L. devotoi*	Mello-Leitão 1917	♀	São Paulo, Pinheiro, Brazil	Galiano 1980
10	*L. eatoni*	Chickering 1946	♀	Pará, Cametá, Vila de Curuçambaba, Várzea, Brazil	Metzner 2022
11	*L. elegans*	F. O. Pickard-Cambridge 1900	♂♀	Coyaz, Mato Crosso	Galiano 1980
				Ribeirão Preto, São Paulo	Logunov 2002
12	*L. elongatus*	Galiano 1980	♀	São Paulo state	Galiano 1980
13	*L. euriensis*	Logunov 2000	♂♀	Amazonas, Manaus, Manaus city, Reserva Ducke	Metzner 2022

Table 1 (continued from previous page). Published records of the distribution of *Lyssomanes* species that have been recorded in Brazil.

ref.	species	authority	♂♀	locality	references
14	*L. florenciae*, sp. n.	Bedoya-Roqueme 2022 (this paper)	♀	Reserva Ecológica e Cientifica, UEG, Anápolis, Goiás, Brazil	Bedoya-Roqueme 2022 (this paper)
15	*L. fossor*	Galiano 1996	♀	Minas Gerais: Serra do Caparaó, Vale Verde, Brazil	Galiano 1996
16	*L. ipanemae*	Galiano 1980	♂♀	Espíritu Santo State, Linhares, Faz Ipanema, Brazil	Galiano 1980
17	*L. janauari*	Logunov & Marusik 2003	♀	Amazonas, Manaus, Lago Janauari, Brazil	Logunov & Marusik 2003
18	*L. jemineus*	Peckham, Peckham & Wheeler 1889	♂♀	Pará, Cametá, Vila de Curuçambaba, Várzea, Brazil	Galiano 1980
19	*L. jucari*	Galiano 1984	♀	Bahia State: Juçarí	Galiano 1984
20	*L. leucomelas*	Mello-Leitão 1917	♂♀	São Paulo, Pinheiro	Galiano 1980
				Parque Serra do Mar, Nucleo Santa Virginia, São Paulo	Logunov 2002
				Pindamonhangaba, São Paulo	Logunov 2002
				Jundiaí, São Paulo	Logunov 2002
				Telêmaco Borba, Paraná	Logunov 2002
21	*L. longipes*	Taczanowski 1871	♂♀	St. Laurent de Maroni, French Guiana	Taczanowski 1871
				Reserva Ducke, Manaus	Galiano 1980
				Usina Hidrelétrica de Balbina, Presidente Figueiredo	Logunov 2002
				Reserva 1501, Km41ZF3, Fazenda Esteio, Manaus	Logunov 2002
				Rio Atininga, Manicoré, Amazonas	Logunov 2002
22	*L. manausensis*	Logunov 2014	♀	Amazonas, Colosso Reserve, near Manaus	Logunov 2014
23	*L. matoensis*	Logunov 2014	♀	Mato Grosso, north of Xavantina	Logunov 2014
24	*L. miniaceus*	Peckham, Peckham & Wheeler 1889	♂♀	near Rio de Janeiro	Peckham, Peckham & Wheeler 1889
25	*L. nigrofimbriatus*	Mello-Leitão 1941	♂♀	Río Negro, Paraná state	Mello-Leitão 1941; Galiano 1980
				Boraceia, São Paulo	Galiano 1980
				Barueri, São Paulo	Galiano 1980
				Cocaia, São Paulo	Galiano 1980
				Nova Friburga, Rio de Janeiro state	Galiano 1980
				Represa Nova, São Paulo	Galiano 1980
				Eugene Lefevre Station, Pindamonhangaba, São Paulo	Galiano 1980
				Ubatuba, São Paulo	Galiano 1980
				Baipendi, Minas Gerais	Galiano 1980
				Santa Rita de Caldas, Minas Gerais	Galiano 1980
26	*L. nigropictus*	Peckham, Peckham & Wheeler 1889	♂♀	Amazonia: Manaus; Pará: Belém, Teffé, São Paulo de Olivença	Galiano 1980
27	*L. parallelus*	Peckham, Peckham & Wheeler 1889	♂♀	Bahía, Una, Reserva Biológica do Una	Galiano 1980
28	*L. paravelox*	Logunov 2002	♂	Fazenda Esteio, Manaus	Logunov 2002
29	*L. pauper*	Mello-Leitão 1945	♂♀	Bahía, São Paulo, Mato Grosso, Santa Catarina States	Galiano 1980
				Pratinha, Iraquara, Bahia	Logunov 2002
30	*L. penicillatus*	Mello-Leitão 1927	♂	Santa Catarina State: Blumenau	Galiano 1980
31	*L. quadrinotatus*	Simon 1900	♂♀	Amazonas: Manaus, Reserva da Campina	Galvis 2018
32	*L. remotus*	Peckham & Peckham 1896	♂♀	Amazonia, Ponta Negra (Manaus); Pará: Belém; Bahía, S. F. do Conde	Galiano 1980
				Campus UFSE, São Cristovão	Logunov 2002
33	*L. robustus*	Taczanowski 1878	♂	Mato Grosso: Utiarití	Galiano 1980
34	*L. romani*	Logunov 2000	♂♀	Amazonas, RioNegro, Umarituba	Logunov 2000
35	*L. santarem*	Galiano 1984	♀	Para State, Santarem	Galiano 1984
36	*L. silvestris*	Logunov 2014	♀	Mato Grosso, north of Xavantina	Logunov 2014
37	*L. similis*	Logunov 2014	♀	Amazonas, Cabo Frio Reserve, near Manaus; Mato Grosso, north of Xavantina	Logunov 2014
38	*L. sylvicola*	Galiano 1980	♂	Pará: Belém	Galiano 1980
39	*L. taczanowskii*	Galiano 1980	♂♀	Acre, Río Alto Purus, west of Sena Madureira, Boca do Chandless	Galiano 1980
40	*L. tapirapensis*	Galiano 1996	♂♀	Mato Grosso: Barra do Tapirape	Galiano 1996
41	*L. tapuiramae*	Galiano 1980	♂	Minas Gerais, Uberlandia, Tapuirama	Galiano 1980
42	*L. tenuis*	Peckham, Peckham & Wheeler 1889	♂♀	Cametá, Pará	Galiano 1980
				Utinga, Pará	Galiano 1980
				Fazenda Velha, Pará	Galiano 1980
				Rio Gumpí, Pará	Galiano 1980
				Parque Nacional da Serra do Divisor	Logunov 2002
				Porto Velho, Rondônia	Logunov 2002
43	*L. tristis*	Peckham, Peckham & Wheeler 1889	♂♀	Brazil (Original description without type locality); Rio de Janeiro, Guanabara District, Rio de Janeiro	Peckham, Peckham & Wheeler 1889; Galiano 1980; Logunov 2014
44	*L. unicolor*	Taczanowski 1871	♂♀	João Pessoa, Paraíba	Logunov 2002
				Igapó, Tarumã-Mirim, Manaus, Amazonas	Logunov 2002
				Campus UFSE, São Cristovão, Sergipe	Logunov 2002
				Balneário de Lira Borba, Amazonas	Logunov 2002
45	*L. velox*	Peckham, Peckham & Wheeler 1889	♂♀	São Paulo, Chamlireyacu, Cerro Paranepura	Galiano 1962
				Reserva Etnica Waorani, Orellana, Ecuador	Logunov & Marusik 2003
46	*L. vinocurae*	Galiano 1996	♂♀	Bahia: Trancoso; Pará: Santarem	Galiano 1996; Logunov 2014
				Crasto, Santa Luiza do Itanhi, Sergipe	Logunov 2002
47	*L. yacui*	Galiano 1984	♂♀	Bahia State, Juçarí	Galiano 1984

Figure 23. Known distribution of *Lyssomanes* species in Brazil. The type locality for *L. florenciae* sp. n. is marked with a diamond in map B (14). Numbers correspond to species listed in Table 1. Map credits: Background image from NASA/EARTHDATA including Blue Marble imagery and political boundaries © OpenStreetMap contributors, the latter used under an Open Database License (ODBL).

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