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STUDY OF COMPOSITION AND ABUNDANCE OF GROUND SPIDERS (ARCHNIDA: ARANEAE) IN TWO PHYTOPHYSIOGNOMIES OF THE CERRADO BIOME IN MARANHÃO, BRAZIL

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Abstract

Brazil is one of the countries with the largest diversity of spiders in the world. However, estimates regarding the real diversity of these animals are incipient in the Northeast, especially in the state of Maranhão. A total of 543 specimens of ground spiders were collected in two phytophysiognomies of the cerrado biome (gallery forest and cerrado *sensu stricto*) located in the Municipal APA of Inhamun, Caxias, Maranhão. We identified 23 families, 37 genera and 43 species (Araneomorphae infraorder), and most of the species found are recorded being for the first time for the state of Maranhão. The families Corinnidae and Oonopidae exhibited higher species richness, whereas the family Zodariidae showed the largest abundance of individuals. The most abundant species in this study were *Leprolochus birabeni* and *Corinna* sp.1.

Keywords: Spider fauna; Edaphic; Diversity.

ESTUDO DA COMPOSIÇÃO E ABUNDÂNCIA DE ARANHAS (ARACHNIDA: ARANEAE) DE SOLO EM DUAS FITOFISIONOMIAS DO CERRADO, MARANHÃO, BRASIL

Resumo

O Brasil é um dos países com a maior diversidade de aranhas do mundo. No entanto, as estimativas em relação a real diversidade desses animais são bastante incipientes no Nordeste, principalmente no Maranhão. Foram coletados um total de 543 espécimes de aranhas de solo em duas fitofisionomias de Cerrado (Mata de Galeria e Cerrado *sensu stricto*) localizadas na APA Municipal do Inhamun, Caxias, Maranhão. Foram identificadas 23 famílias, 37 gêneros e 43 espécies (infraordem Araneomorphae), sendo que a maioria das espécies encontradas são registradas pela primeira vez para o estado do Maranhão. As famílias Corinnidae e Oonopidae apresentaram maior riqueza de espécies, enquanto a família Zodariidae a maior abundância de

indivíduos. As espécies mais abundantes neste estudo foram *Leprolochus birabeni* e *Corinna* sp.1.

Palavras-chave: Araneofauna; Edáfica; Diversidade.

ESTUDIO DE LA COMPOSICIÓN Y ABUNDANCIA DE ARAÑAS (ARACHNIDA: ARANEAE) DEL SUELO EM DOS FITOFISIOGNOMÍAS EM EL CERRADO, MARANHÃO, BRASIL

Resumen

Brasil es uno de los países con mayor diversidad de arañas del mundo. Sin embargo, las estimaciones con respecto a la diversidad real de estos animales son bastante incipientes en el Nordeste, especialmente en Maranhão. Se recolectaron un total de 543 especímenes de arañas del suelo en dos fitofisiognomías en el Cerrado (Mata de Galeria y Cerrado *sensu stricto*) ubicado en el Inhamun Municipal APA, Caxias, Maranhão. Se identificaron 23 familias, 37 géneros y 43 especies (infraorden Araneomorphae), y la mayoría de las especies se registraron por primera vez en el estado de Maranhão. Las familias Corinnidae y Oonopidae tuvieron la mayor riqueza de especies, mientras que la familia Zodariidae la mayor abundancia de individuos. Las especies más abundantes en este estudio fueron *Leprolochus birabeni* y *Corinna* sp.1.

Palabras-clave: Araneofauna; Edáfica; Diversidade.

1. INTRODUCTION

The 'cerrado' constitutes the second largest biome in original area in Brazil, and its physiognomic heterogeneity reveals a marked environmental diversity (CONCEIÇÃO; CASTRO, 2009). In the northeast region of the country, the highest concentrations of cerrado vegetation are found in the states of Piauí and Maranhão, with approximately 10,000,000 ha, distributed into more than 38 municipalities (NERES; CONCEIÇÃO, 2010). Despite its diversity, there has been intensive degradation in the cerrado (LEITE et al., 2010). Therefore, new studies on the dynamics and composition of species existing in this biome are encouraged (CARVALHO; AVELINO, 2010).

Brazil is one of the countries with the greatest diversity of spiders in the world (BRESCOVIT; OLIVEIRA; SANTOS, 2011). The order Araneae is the second largest group of arachnids, with approximately 47,663 described species that are distributed worldwide into 117 families (World Spider Catalog, 2020). A total of 625 species have been recorded for the cerrado, 169 of which are endemic to this biome (OLIVEIRA; BRESCOVIT; SANTOS, 2017). The order Araneae is divided into two suborders, namely, Mesothelae (arachnids with primitive traits) and Opisthothelae (comprising all other spiders), the latter of which is represented by two infraorders: Mygalomorphae and Araneomorphae (FOELIX, 2011).

Spiders are recognized as bioindicators of environmental quality owing to their extreme sensitivity in response to natural and anthropic disturbances. In addition, they are recognized as biological control agents for phytophagous insects (ROCHA, 2017). In spite of its ecological importance, this is the least studied taxon in the cerrado, with few records of taxonomic focus and geographic distribution existing (CARVALHO; AVELINO, 2010; MORAES, 2014; SANTANA, 2015; OLIVEIRA; BRESCOVIT; SANTOS, 2017).

The Municipal Environmental Protection Area (APA) of Inhamun is considered an important local ecological heritage. Nonetheless, studies on ground spiders in this protection area are poorly sampled. Therefore, the present study aimed to undertake a survey of the composition and abundance of ground spiders in two phytophysiognomies in the cerrado biome of APA do Inhamum, located in the municipality of Caxias, state of Maranhão. This study represents a contribution to the knowledge of the spider biodiversity in the region, constituting the first standardized survey developed in it.

2. METODOLOGY

2.1. Characterization of the stude area

Collections were carried out in two experimental areas delimited in the APA of Inhamun in Caxias, Maranhão, representing two typical cerrado vegetation types: gallery forest and cerrado *sensu stricto* (Figure 1). The APA of Inhamum is characterized by a dry sub-humid climate, with two well-defined seasons: rainy, from January to June; and dry, from July to December (ALBUQUERQUE, 2012). The region has regular precipitation indices between 1,600 and 1,800 mm and normally elevated temperatures, whose annual average is higher than 24 °C. The local vegetation is composed of grasses in a flat area, which is characteristic of 'cerradão', 'chapada' and 'cerrado' biomes, and small points of closed forest (ALBUQUERQUE, 2012; CONCEIÇÃO; da SILVA; RODRIGUES, 2014; da SILVA et al., 2016). In the cerrado biome, the gallery forest is characterized by shrubs and trees scattered with large amounts of grass and plant litter, with a canopy open to semi-open and closed in some places. Predominant plant families are Fabaceae, Myrtaceae, Poaceae and Rubiaceae (da SILVA et al., 2016). The cerrado *sensu stricto* has typical vegetation, with small to medium-sized trees, shrubs, a canopy open to semi-open and a predominance of the families Arecaceae, Fabaceae, Caryocaraceae and Rubiaceae, among others (CONCEIÇÃO; da SILVA; RODRIGUES, 2014).

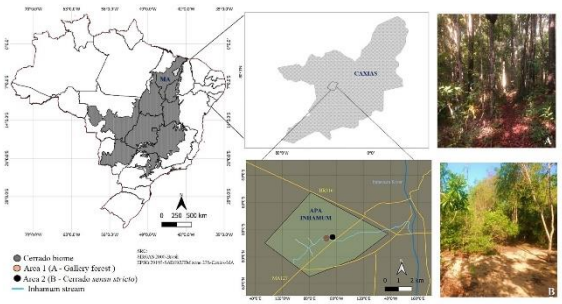

Figure 1 - Map of the Municipal Environmental Protection Area of Inhamum, in the municipality of Caxias/MA, highlighting the studied vegetation types. Source: developed by the authors (2020).

2.2. Material collection and identification

The material was collected during the dry (October, November and December 2017) and rainy (January, February, March and April 2018) seasons using Provid-type traps (FORNAZIER et al., 2007; GIRACCA et al., 2003). The traps were distributed between gallery forest (Area 1) and cerrado *sensu stricto* (Area 2). Six parallel transects were established in each area, spaced approximately 10 m apart, and each transect was marked by five equidistant sampling units (10 m × 10 m), with 30 points sampled in each area, totaling 60 points. The traps were left in the field for a period of 96 h (DRESCHER et al., 2007).

After this period, the material was removed from the ground and taken to the laboratory for manual sorting using 0.25-mm mesh sieves. The collected spiders were fixed in 70% ethyl alcohol and sent for identification at the Butantan Institute. Adult individuals were identified at the level of species or morpho-species, whereas immature individuals were counted and discarded, thereby not participating in the qualitative analyses. The entire material is deposited in the collection of the Laboratory of Zoological Collections of the Butantan Institute (Curator: A. D. Brescovit). Specimen collection was authorized by ICMBio/IBAMA, Federal Institute of the Environment (License no. 583781).

2.3. Statistical analysis

The soil temperature (10-cm depth) was monitored using a digital stem thermometer. Precipitation data during the collection periods were obtained from the Meteorological Station of Caxias, Maranhão. For statistical analysis, a database was initially produced using Microsoft Excel software, from which a table was built with the composition of the spiders found in the two areas. Faunal analyses based on the indices of dominance, abundance, frequency and constancy of the collected taxa were made using ANAFAU software (MORAES et al., 2003). Graphs were also generated to correlate the physical factors (temperature and precipitation) with the richness and abundance of the collected individuals.

3. RESULTS AND DISCUSSION

A total of 543 specimens of ground spiders were collected, corresponding to 253 adults (46.60%) and 290 juveniles (53.40%). Of the total adult specimens, 111 were collected in Area 1 (43.87% - gallery forest) and 142 individuals originated from Area 2 (56.13% - cerrado *sensu stricto*). Among the recorded adults, 71.15% were males (180 individuals) and 28.85% were females (73 individuals). This survey identified 23 families, 37 genera and 43 species belonging to the infraorder Araneomorphae (Table 1).

Thirty-one species were recorded in Area 1. These were distributed in 17 families, four of which were exclusive to the gallery forest: Caponiidae, Mysmenidae, Pisauridae and Theridiidae. The families with the highest species richness were Corinnidae and Oonopidae. Two families showed considerable results for abundance of individuals: Zodariidae and Corinnidae, which together, accounted for 44% of the total ground spiders collected in Area 1 (Table 1).

Thirty-two species were recorded in Area 2, which were distributed in 19 families. Six of these families occurred only in the cerrado *sensu stricto*, namely, Hahniidae, Miturgidae, Prodidomidae, Sicariidae, Scytodidae and Theraphosidae. The families Corinnidae and Oonopidae were those with the highest species richness. Zodariidae and Corinnidae were also the most representative families in terms of abundance of individuals, corresponding to 53% of the ground spiders collected in Area 2 (Table 1).

The prominence of the families Corinnidae, Oonopidae and Zodariidae has also been reported in other studies on the ground spider fauna in cerrado biomes in Northeast Brazil (DIAS; BRESCOVIT; MENEZES, 2005; CARVALHO; AVELINO, 2010; CUNHA et al., 2012; AZEVEDO et al., 2017). Cunha et al. (2012) analyzed the composition and richness of ground spiders in two fragments of the coastal cerrado in Maranhão and observed that the most abundant families were Corinnidae and Zodariidae, the latter being highly representative in both analyzed areas (Tutóia and Paulino Neves). Also according to those authors, the family Corinnidae had the greatest species richness.

Carvalho and Avelino (2010) conducted a survey of ground spiders in four phytophysiognomies in the cerrado biome (Maranhão Babaçu forests, primary semi-deciduous dry forest, secondary semi-deciduous dry forest and typical cerrado), on a farm in the municipality of José de Freitas, state of Piauí. In their study, the family Corinnidae had the largest number of species, whereas Zodariidae showed the greatest abundance of individuals.

Dias, Brescovit and Menezes (2005) compared the relative abundance and composition of the ground spider fauna in six forest environments (cocoa-cabruca, capoeira, border and interior of forest fragment and border and interior of continuous forest) in the municipalities of Ilhéus and Una, state of Bahia, and observed that the families Oonopidae and Corinnidae stood out in abundance of individuals and species richness, respectively.

Of the 43 identified species, 18 were singletons or rare (r) and eight were doubletons or scattered (s) (Table 1). In both analyzed areas, the most abundant species was *Leprolochus birabeni* Mello-Leitão 1942, with 66 individuals, which were captured in all months of collection. Most of the species found in this study are being recorded for the first time for the state of Maranhão, accounting for 70% of the identified species (Table 1).

The first record on the composition of ground spider fauna for cerrados in the state of Maranhão was made by Cunha et al. (2012) in two coastal areas (Tutóia and Paulino Neves). In their survey, a total of 234 spiders were obtained, consisting of 142 adults (61%) and 92 juveniles (39%) distributed into 12 families, 18 genera and 19 species. As also observed in our results, the family that had the largest number of individuals was Zodariidae and the most abundant species was *Leprolochus* sp.

Three species were dominant (D) in both Area 1 and Area 2: *Corinna* sp.1, *Kambiwa* sp. and *L. birabeni*. The species *Ctenus* sp.1 and *Ochyrocera* sp. were also dominant only in the gallery forest (Area 1), and *Camillina* sp., *Epicratinus* sp. and *Oonopoides* sp.1 in the cerrado *stricto sensu* (Area 2). The other recorded species were classified as non-dominant (ND), with frequencies below 2-5%.

The species that showed to be dominant were, consequently, also those which exhibited the highest frequency, thus being considered very frequent (VF), namely, Area 1 - *Corinna* sp.1, *Ctenus* sp.1, *Kambiwa* sp., *L. birabeni* and *Ochyrocera* sp.; and Area 2 - *Camillina* sp., *Corinna* sp.1, *Epicratinus* sp., Kambiwa sp., *L. birabeni* and *Oonopoides* sp.1. The species classified as frequent (F) were: Area 1 - *Ctenus* sp.2, *Hexapopha* sp., *Oonopoides* sp.2, *Otiothops* sp., *Parachemmis* sp., *Soesilarishius* sp. and *Sphecozone* sp.; Area 2 - *Ctenus* sp.1, *Goeldia* sp., *Hexapopha* sp.1, *Neotrops* sp. and *Neoxyphinus* sp. The other species were found at frequencies lower than the confidence interval limit of 5% and, therefore, were classified as uncommon (LF).

As regards the constancy of the collected ground spiders, in the gallery forest, four species were considered constant (W) (Area 1) (*Corinna* sp., *Kambiwa* sp., *L. birabeni* and *Ochyrocera* sp.) and eight accessory (Y) (*Ctenus* sp.1, *Ctenus* sp.2, *Hexapopha* sp.1, *Oonopoides* sp.2, *Otiothops* sp., *Parachemmis* sp., *Soesilarishius* sp. and *Sphecozone* sp.). In the cerrado *stricto sensu* (Area 2), only the species *L. birabeni* was considered constant, whereas 13 species were classified as accessory (*Apopyllus* sp., *Camillina* sp., *Corinna* sp.1, *Ctenus* sp.1, *Epicratinus* sp., *Goeldia* sp., *Hexapopha* sp.1, *Kambiwa* sp., *Neotrops* sp., *Neoxyphinus* sp., *Oonopoides* sp.1, *Soesilarishius* sp. and *Teminius insularis*). However, the majority of species recorded in both areas were present in less than 20% of collections; for this reason, they were considered accidental (Z).

The species *Corinna* sp.1 and *L. birabeni* were the most dominant, frequent and constant both in the gallery forest and in the cerrado *stricto sensu* environment. Other studies have also reported the dominance of these spider species in cerrado phytophysiognomies in Maranhão and in other northeastern states (DIAS; BRESCOVIT; MENEZES, 2005; CARVALHO; AVELINO, 2010; CUNHA et al., 2012; AZEVEDO et al., 2017).

The variation in the richness and abundance of ground spiders was influenced in different ways by the soil temperature (ºC) and precipitation (mm) occurring during the collection periods (dry and rainy). No significant difference was found in total richness of species recorded between the dry (Area 1 = 25; Area 2 = 22) and rainy (Area 1 = 31; Area 2 = 33) seasons. In the gallery forest, greater species richness was observed between the months of December (n = 11) and January (n = 10), during the transition from the dry to the rainy season. In the cerrado *sensu stricto*, the greatest record of number of species was observed in the rainy season between the months of January (n = 8), February (n = 11) and March (n = 9) (Figure 2).

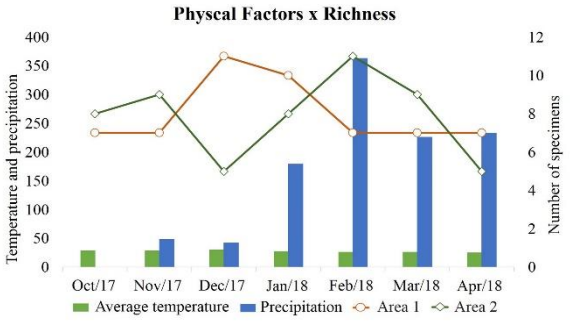

Figure 2 - Variation in species richness as a function of soil temperature and precipitation in the APA of Inhamun, Caxias - MA, from October 2017 to April 2018. Source: developed by the authors (2019).

In terms of abundance of individuals, the number of specimens collected in the dry season was practically constant in both areas (Area 1 = 59; Area 2 = 57), although the largest number of individuals for the gallery forest occurred in the month of December 2017 and, for cerrado *sensu stricto*, in October 2017. In the rainy season, however, there was a decrease in the abundance of specimens collected in Area 1 (n = 52) as compared with Area 2 (n = 85), mainly in the first sampled months (Figure 3).

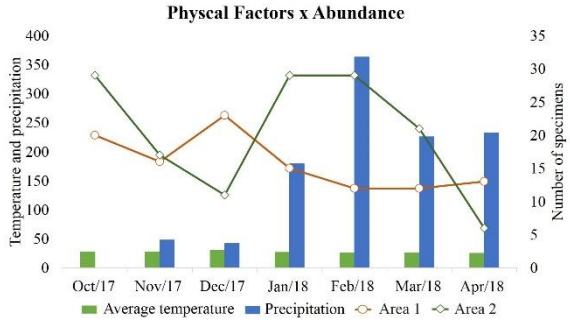

Figure 3 - Variation in abundance of specimens as a function of soil temperature and precipitation in the APA of Inhamun, Caxias - MA, from October 2017 to April 2018. Source: developed by the authors (2019).

The greater abundance of spiders in the warmer months is explained by the fact that they are more active in the search for prey and reproduction (males, mainly). In the colder months, there is a decrease in abundance, since the availability of prey decreases considerably, which forces them to store energy and not forage with the same frequency (FERRO, 2008; FRANCISCO, 2011; SOUSA, 2016; LIMA et al., 2019).

In the transition from the dry to the rainy season, an increase was observed in the number of individuals recorded in the cerrado *sensu stricto* (n = 85), especially in the months of January and February of 2018, corresponding to 60% of the individuals collected in Area 2 during this period, although this index gradually decreased in the subsequent months. In the gallery forest, although the transition from dry to rainy season was marked by a decrease in number of individuals, this number

remained constant in February, March and April of 2018 (n = 12, 12 and 13, respectively) (Figure 3).

Interestingly, the two most abundant species (*L. birabeni* and *Corinna* sp.1) showed variations in number of individuals recorded during the dry and rainy seasons. The species *L. birabeni* was captured in all months of collection, with predominance in the dry season (n = 50). However, in the colder months, there was a decrease in the abundance of these individuals (n = 16). The species *Corinna* sp. was also captured in almost all collection months (except October), but with greater prevalence during the rainy season (n = 24) as compared, for instance, with the warmer months (n = 10) (Table 2).

According to Jocqué (1988) and Sousa (2016), although the foraging and reproduction activities of some spider species are restricted to the dry season, other species may maintain their activities normal in both seasons (dry and rainy). For instance, some species of the family Corinnidae may be recorded in both the dry and rainy seasons, with precipitation ranging from medium to high.

4. FINAL CONSIDERATIONS

The obtained results allow us to temporarily and locally infer that the ground spider fauna composition in the two fragments of the APA of Inhamum (gallery forest and cerrado *census stricto*) differs between these environments. The families Corinnidae and Oonopidae had the highest species richness and the family Zodariidae had the largest number of individuals, with *L. birabeni* and *Corinna* sp.1 being the most abundant species. The present study constitutes the first inventory of ground spider fauna in the APA of Inhamum, Caxias, Maranhão.

This study is expected to foster the development of new research, mainly in the existing preservation areas in the municipality, thus contributing to the knowledge of the local ground spider fauna and to the preservation of the environment. The preservation of forest fragments, whether impacted or not, is important for the conservation and maintenance of spider species in the cerrado biome, which are still quite unknown, especially in the northeast region of Brazil.

Table 1 - Composition of ground spiders collected in two cerrado phytophysiognomies in the APA of Inhamum, Caxias - MA, from October 2017 to April 2018. Source: developed by the authors (2019).

	Phytophysiognomy		
Family/Species	**Area 1 (%)**	**Area 2 (%)**	**Total**
Caponiidae*			
Caponina sp. (Simon, 1892) [NR/R]	1 (0.90)	0	1
Corinnidae			
Abapeba sp. (Bonaldo, 2000) [NR/S]	1 (0.90)	1 (0.70)	2
Attacobius sp. (Mello-Leitão, 1925) [R]	1 (0.90)	0	1
Castianeira sp.1 (Keyserling, 1879) [R]	1 (0.90)	0	1
Castianeira sp.2 (Keyserling, 1879) [S]	1 (0.90)	1 (0.70)	2
Corinna sp.1 (C. L. Koch, 1841)	16 (14.41)	18 (12.68)	34
Corinna sp.2 (C. L. Koch, 1841) [S]	1 (0.90)	1 (0.70)	2
Parachemmis sp. (Chickering, 1937) [NR]	3 (2.70)	1 (0.70)	4
Ctenidae			
Ancylometes rufus (Walckenaer, 1837) [NR/R]	0	1 (0.70)	1
Ctenus sp.1 (Walckenaer, 1805) [NR]	8 (7.21)	4 (2.82)	12
Ctenus sp.2 (Walckenaer, 1805) [NR/S]	2 (1.80)	0	2

Gnaphosidae			
Apopyllus sp. (Platnick & Shadab, 1984)	1 (0.90)	2 (1.41)	3
Camillina sp. (Berland, 1919)	1 (0.90)	8 (5.63)	9
Hahniidae**			
Neohahnia sp. (Mello-Leitão, 1917) [NR/R]	0	1 (0.70)	1
Idiopidae			
Idiops sp.1 (Perty, 1833) [NR/R]	0	1 (0.70)	1
Idiops sp.2 (Perty, 1833) [NR/R]	1 (0.90)	0	1
Linyphiidae			
Meioneta sp. (Millidge, 1991) [NR/R]	0	1 (0.70)	1
Sphecozone sp. (O. Pickard-Cambridge, 1871) [NR]	2 (1.80)	1 (0.70)	3
Miturgidae**			
Teminius insularis (Lucas, 1857) [S]	0	2 (1.41)	2
Mysmenidae*			
Microdipoena sp. (Banks, 1895) [NR/R]	1 (0.90)	0	1
Ochyroceratidae			
Ochyrocera sp. (Simon, 1892) [NR]	15 (13.51)	1 (0.70)	16
Oonopidae			
Gamasomorpha sp. (Karsch, 1881) [NR/S]	1 (0.90)	1 (0.70)	2
Hexapopha sp.1 (Platnick, Berniker & Víquez, 2014) [NR]	3 (2.70)	3 (2.11)	6
Hexapopha sp.2 (Platnick, Berniker & Víquez, 2014) [NR/R]	1 (0.90)	0	1
Neotrops sp. (Grismado & Ramírez, 2013) [NR]	0	4 (2.82)	4
Neoxyphinus sp. (Birabén, 1953)	0	4 (2.82)	4
Oonopoides sp.1 (Bryant, 1940) [NR]	1 (0.90)	9 (6.34)	10
Oonopoides sp.2 (Bryant, 1940) [NR/S]	2 (1.80)	0	2
Palpimanidae			
Otiothops sp. (MacLeay, 1839)	2 (1.80)	1 (0.70)	3

Pholcidae			
Kambiwa sp. (Huber, 2000) [NR]	13 (11.71)	11 (7.75)	24
Pisauridae*			
Architis sp. (Simon, 1898) [NR/R]	1 (0.90)	0	1
Prodidomidae**			
Prodidomus sp. (Lucas, 1846) [NR/R]	0	1 (0.70)	1
Salticidae			
Asaphobelis sp. (Simon, 1902) [NR/R]	1 (0.90)	0	1
Chira sp. (Peckham & Peckham, 1896) [NR/R]	0	1 (0.70)	1
Soesilarishius sp. (Makhan, 2007) [NR]	2 (1.80)	2 (1.41)	4
Sicariidae**			
Loxosceles amazonica (Gertsch, 1967) [R]	0	1 (0.70)	1
Scytodidae**			
Scytodes sp. (Latreille, 1804) [NR/R]	0	1 (0.70)	1
Theraphosidae**			
Hapalopus sp. (Ausserer, 1875) [NR/R]	0	1 (0.70)	1
Theridiidae*			
Latrodectus sp. (Walckenaer, 1805) [NR/R]	1 (0.90)	0	1
Titanoecidae			
Goeldia sp. (Keyserling, 1891) [NR]	1 (0.90)	3 (2.11)	4
Trachelidae			
Orthobula sp. (Simon, 1897) [NR/S]	1 (0.90)	1 (0.70)	2
Zodariidae			
Epicratinus sp. (Jocqué & Baert, 2005) [NR]	1 (0.90)	12 (8.45)	13
Leprolochus birabeni (Mello-Leitão, 1942)	24 (21.62)	42 (29.58)	66
TOTAL	111 (100%)	142 (100%)	253

Families exclusive to Area 1 (gallery forest); **Families exclusive to Area 2 (cerrado sensu stricto);* ***NR* *= new record.* ***R*** *= rare;* ***S*** *= scattered.*

Table 2 - Presence and absence of ground spiders collected during the dry and rainy seasons in the APA of Inhamun, Caxias - MA, from October 2017 to April 2018. Source: developed by the authors (2019).

	AREA 1							**AREA 2**							
	Dry				**Rainy**			**Dry**				**Rainy**			
Species/Month	**10**	**11**	**12**	**01**	**02**	**03**	**04**	**10**	**11**	**12**	**01**	**02**	**03**	**04**	**T**
Abapeba sp.	-	-	-	-	-	1	-	-	-	-	-	-	1	-	2
Ancylometes rufus	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
Apopyllus sp.	-	-	1	-	-	-	-	-	-	-	-	1	1	-	3
Architis sp.	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Asaphobelis sp.	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
Attacobius sp.	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
Camillina sp.	-	-	-	-	-	1	-	-	-	-	1	7	-	-	9
Caponina sp.	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1
Castianeira sp.1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Castianeira sp.2	-	-	-	1	-	-	-	-	-	-	1	-	-	-	2
Chira sp.	-	-	-	-	-	-	-	-	-	-	-	2	-	-	2
Corinna sp.1	-	3	6	2	1	2	2	-	1	-	11	6	-	-	34
Corinna sp.2	-	1	-	-	-	-	-	-	-	-	-	-	-	1	2
Ctenus sp.1	-	-	-	3	5	-	-	-	2	-	1	-	1	-	12
Ctenus sp.2	-	-	-	1	1	-	-	-	-	-	-	-	-	-	2
Epicratinus sp.	-	-	1	-	-	-	-	-	-	-	7	5	-	-	13
Gamasomorpha sp	-	-	1	-	-	-	-	1	-	-	-	-	-	-	2
Goeldia sp.	1	-	-	-	-	-	-	3	-	-	-	-	-	-	4
Hapalopus sp.	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
Hexapopha sp.1	-	-	-	1	-	2	-	-	-	-	-	1	2	-	6
Hexapopha sp.2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Idiops sp.1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1
Idiops sp.2	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1

Kambiwa sp.	4	3	4	1	-	1	-	4	1	3	3	-	-	-	24
Latrodectus sp.	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
Leprolochus birabeni	11	6	5	-	1	-	1	17	7	4	4	3	5	2	66
Loxosceles amazonica	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1
Meioneta sp.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1
Microdipoena sp.	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
Neohahnia sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
Neotrops sp.	-	-	-	-	-	-	-	1	1	2	-	-	-	-	4
Neoxyphinus sp.	-	-	-	-	-	-	-	-	2	1	-	-	1	-	4
Ochyrocera sp.	-	-	1	3	2	4	5	-	-	-	-	-	-	1	16
Oonopoides sp.1	-	-	1	-	-	-	-	1	-	-	-	-	7	1	10
Oonopoides sp.2	-	-	1	1	-	-	-	-	-	-	-	-	-	-	2
Orthobula sp.	-	1	-	-	-	-	-	1	-	-	-	-	-	-	2
Otiothops sp.	1	1	-	-	-	-	-	-	-	-	-	-	1	-	3
Parachemmis sp.	-	-	1	1	1	-	-	-	-	-	-	-	1	-	4
Prodidomus sp.	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
Scytodes sp.	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
Soesilarishius sp.	-	1	-	-	-	1	-	-	-	-	-	1	1	-	4
Sphecozone sp.	-	-	-	1	1	-	-	-	-	-	1	-	-		3
Teminius insularis	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
TOTAL															253

***10**= October; **11**= November; **12**= December; **01**= January; **02**= February; **03**= March; **04**= April; **T**= Total.*

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