Spider Assemblages in widely-separated patches of cerrado in São Paulo State, Brazil

Assembléias de aranhas em manchas de cerrado amplamente separadas no Estado de São Paulo, Brasil

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Spiders are abundant, ubiquitous generalist predators in terrestrial ecosystems. The distribution and abundance of these arachnids and insects largely depends on the physical structure of their habitat (reviews in UETZ, 1991; WISE, 1993). The plants provide the spiders with hiding places from predators, attachment sites for webs, sites for feeding and reproduction, all factors effectively affected by the habitat architecture (HALAJ, CADY & UETZ, 2000 a; STUNTZ *et al*. 2002; RIIHIMÄKI *et al*. 2006).

Several authors (reviews in TURNBULL,1973) have discussed about the factors that influence the spider distribution. It has been suggested that structural components in the habitats maybe especially important to the composition and evolution of plant-living arthropod communities (GUNNARSSON, 1990) including insects (LAWTON, 1983) that are preys of spiders. SCHICK (1965) was convinced that many species of Thomisidae are host-plant specific and DUFFY (1966) considered that the physical form of the vegetation is the more important factor to determine the dis-

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tributions of some species. Considering that although spiders generally do not have a strong association with the plants on which they live, ROMERO & VASCONCELLOS-NETO (2005) demonstrated that a species of Salticidae do it with bromeliads. However it is not evaluated that spiders select suitable microhabitats in natural and complex habitats like cerrado patches.

Spider populations living in contiguous areas possessing different plant associations show marked differences of species compositions (KAJAK, 1960; PECK, WARREN & BROWN, 1971; WHITCOMB, EXLINE & HITE, 1963; RINALDI & FORTI, 1997). Although many spider species tend to occur across a wide range of habitats, associations among species seem to vary in a predictable manner across different vegetation types (TURNBULL, 1973; UETZ, HAJAJ & CADY, 1999). Studies conducted in various agricultural systems have shown that spiders are not randomly distributed in this habitat (TOPPING & LÖVEI, 1997; SAMU, SUNDERLAND & SZINETÁR, 1999; HALAJ, CADY & UETZ, 2000b; RINALDI, PRADO & CADY, 2002). The occurrence of spider species in species of plants localized in patches distant geographically, is an interesting situation for analyze the association between spiders and vegetation.

Cerrado is a savanna-like formation generally having two vegetation layers consisting of a canopy (trees and shrubs up to 6 meters high) and an understory of herbaceous plants. The biodiversity of cerrado is distinctive, and has a high rate of endemism (SILVA, 1995). The cerrado was formerly one of the most extensive biotypes in the State of São Paulo, Brazil (DURIGAN, LEITÃO FILHO & RODRIGUES, 1994). Myrtaceae figured as one the most representative family in floristic surveys in São Paulo cerrado (KRONKA, 1998). Nowadays the São Paulo area covered by cerrado is represented by separated fragments (CAVASSAN, 2002).

This work aims at studying the spider fauna inhabiting a woody plant cerrado, *Myrcia* (Myrtaceae), and comparing three patches of this type of vegetation geographically separated in São Paulo state, Brazil. Habitat and microhabitat influence over spider abundance distribution are investigated.

MATERIALS AND METHODS

The general climate in the cerrado areas is tropical seasonal, with the dry period during the colder months (May – September or October; 125cm-200cm annually), and the mean annual temperature varies between 20^{o}-26^{o}C (NIMER 1979).

Sampling effort was standardized for three species of *Myrcia* (Myrtaceae; “myrtle”), which is the one of dominant woody plant in these cerrado areas and the surrounding shrubs located in three different cerrado regions. The cerrado patches exhibiting distinctive phytosociologies:

Pirassununga (21°56'20"S, 47°28'26"W, São Paulo University, USP), São Carlos (21°54'50"S, 47°40'21"W, Canchim Farm — EMBRAPA), and Luís Antônio (21°36'13"S, 47°47'17"W, Jataí Ecological Station). According to a standard classification scheme (Sano and Almeida 1988), Pirassununga had a typical cerrado vegetation density ("cerrado típico"), while São Carlos was more open ("campo cerrado"), and Luís Antônio is considered a typical cerrado but with slightly denser vegetation.

Myrcia was the most abundant Myrtaceae in the patches. The three target *Myrcia* species were: *Myrcia guianensis* (Aubl.) DC present in the three patches, *Myrcia venulosa* DC common in São Carlos and Pirassununga, and *Myrcia bella* Cambess, found only in Luís Antônio. The cerrado patch in Luís Antônio (4500 ha) is an extensive native cerrado vegetation, surrounded by riparian forest crops (*Pinus* and *Eucalyptus*). Urban areas surround the other two cerrado patches of São Carlos (800 ha) and Pirassununga (100 ha).

SAMPLING

The survey was conducted during the summer (January, 24 - 26), fall (May, 2-5), winter (July, 25-26) and spring (30-31 October and 1 November) of 2000. Leaves and branches of the target *Myrcia* and of the vegetation within 1m^2 around were sampled by stick- beating, and the dropping animals were collected on a white plastic tray of 68 X 58 cm with a rim 11 cm high, impregnated with unrefined talc in order to hinder escape (RINALDI & FORTI, 1997). The beating effort standardized from each target *Myrcia* and each 1m^2 of surrounding shrub was 12-15 minutes. Three individuals of each *Myrcia* species were evaluated on each date producing collections of the canopy of 12 trees of each *Myrcia* species and 12m^2 of surrounding shrubs per cerrado patch. The spider specimens collected were fixed in 70% alcohol for examination and classification into guilds (UETZ et al. 1999). Voucher specimens are deposited in the Spider Collection of the Zoology Department, Biosciences Institute, UNESP, Botucatu, São Paulo, Brazil (UBTU Spider Collection, Rinaldi curator): http://splink.cria.org.br/manager/detail?resource=UBTU&setlang=pt).

DATA ANALYSES

The samples were classified into 12 habitat/microhabitat groups according to local of the patch, tree species, and microhabitat (target tree or adjacent shrub). The labels used were GT1, GS1, GT2, GS2, GT3, GS3, VT1, VS1, VT2, VS2, BT3 and BS3 such that the first character refers to *Myrcia* species (G for *M. guianensis*; V for *M. vellunosa*. and B for *M. bella*), the second for microhabitat (T=target tree and S=adjacent shrub) and the third for local (1=São Carlos, 2=Pirassununga and 3=Luís Antônio). Spider species abundance data collected along the year were pooled. Only species represented by 5 individuals or more (30 species) were considered for the analysis. Correspondence analysis was used for ordination of species and groups based on their abundance. Three environmental factors were thought to explain the ordination: patch local with three levels, *Myrcia* species with 3 levels and microhabitat with two levels. To assess their significance in explaining the ordination a permutation test (1000 permutations) was used. Canonical correspondence analysis (CCA, TER BRAAK, 1995) was applied for relating the patterns in species richness and/or abundance to the significant environmental factors. The results were displayed as an ordination diagram. Calculations were performed using the R language (R DEVELOPMENT CORE TEAM, 2007) and the vegan package (OKSANEN *ET AL.,* 2007).

RESULTS

A total of 859 spiders belonging to 21 families and 75 species were collected (Table 1). Abundance and richness of the spider species was slightly lower on the target trees than on the adjacent shrubs (Table 1). São Carlos and Luís Antônio had the highest spider abundance, and Luís Antônio had the greatest number of spider species (Table 1). The proportion of shared spider families on each *Myrcia* species and their adjacent shrubs was consistently high (Table 1), while the proportion of shared species was consistently low except for Luís Antônio where 44.4 to 45.7 % of the spider fauna was shared between target *Myrcia* species and their shrub surrounding (Table 1).

Table 1. Summary of spiders collected by beating from three *Myrcia* (Myrtaceae) in three cerrado patches of the State of São Paulo, Brazil. "Target"=specific species of *Myrcia*, "shrub"= shrubs surrounding the target.

Cerrado patch	*Myrcia* species	Number of spiders			Number of spider families		Number of spiders species			%Share d families	%Share d species
		target	shru b	total	target	shru b	target	shrub	total	target+ shrub	targe+ shrub
São Carlos	*guianensi*	145	75	220	7	11	16	17	30	63.6	33.3
	venulosa	34	84	118	6	9	10	15	20	50.0	25.0
Pirassununga	*guianensis*	38	51	89	9	11	12	22	28	59.8	21.4
	venulosa	36	80	116	8	11	16	20	29	46.1	24.1
Luís Antônio	*guianensis*	79	96	175	10	13	24	28	36	76.9	44.4
	bella	64	77	141	11	11	24	27	35	69.2	45.7
Total spiders		396	463	859	18	19	75	60	75	75.0	58.7

The numbers of spider families per patch varied from 18 (Pirassununga) to 16 (Luís Antônio) and 12 (São Carlos) (Fig. 1). Nine families, six hunting and three web-weaving spiders, were found in all three patches (Fig.1). Pirassununga and Luís Antônio shared the most spider families, and twelve families were found in just one or two habitats (Fig. 1).

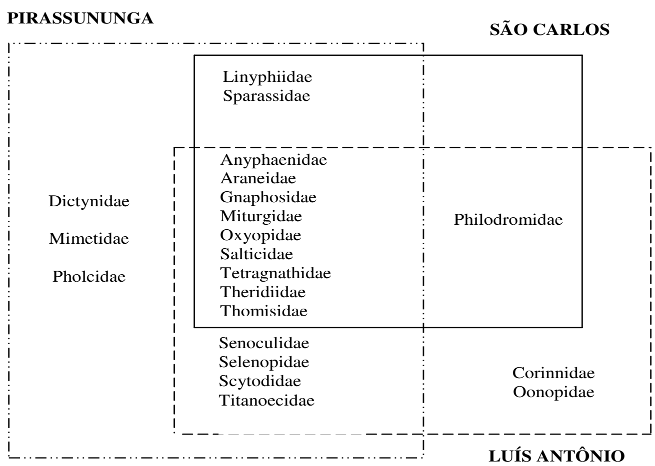

Fig. 1. Co-occurrence of the spider families collected in three *Myrcia* species in three patches of cerrado in the State of São Paulo, Brazil.

The largest number of spiders was captured in the summer and the lowest number was found in the spring (Table 2). The low spring numbers probably results from the impact of low temperatures (including frosts) in the winter, directly impacting the spiders and probably reducing prey abundance.

Anyphaenidae sp 1 was the most abundant species across all microhabitats (Table 3), but only immatures were collected. Other frequent

Table 2. Seasonal collections of spiders from three species of *Myrcia* (Myrtaceae) in three cerrado patches of the State of São Paulo, Brazil. "Target"=specific species of *Myrcia*, "shrub"= shrubs surrounding the target.

Collections	Micro-habitat	São Carlos		Pirassununga		Luís Antônio		Total
		guianensis	*venulosa*	*guianensis*	*venulosa*	*guianensis*	*bella*	
Summer	target	87	19	7	19	43	29	204
	shrub	35	45	13	48	50	34	225
Autumn	target	12	9	19	8	14	17	79
	shrub	6	16	21	18	13	13	87
Winter	target	32	6	6	5	9	14	72
	shrub	23	15	10	6	9	25	88
Spring	target	14	7	3	4	12	4	44
	shrub	11	10	1	8	24	6	60
Total Spiders		220	118	80	116	174	142	859

Table 3. Spiders in three *Myrcia* species of three patches of cerrado from State of São Paulo, Brazil. Cerrado patches: (1=São Carlos, 2=Pirassununga, 3=Luis Antônio); *Myrcia* species: (G=*guianensis*, V=*venulosa*, B=*bella*); microhabitat: (T=target, S=shrub). "Target"=specific species of *Myrcia*, "shrub"= shrubs surrounding the target.

id[1]	Araneae (Taxa)	Habitat/microhabitat groups											
		GT1	GS1	GT2	GS2	GT3	GS3	VT1	VS1	VT2	VS2	BT3	BS3
	ANYPHAENIDAE *(foliage runners)*												
1	Anyphaenidae sp 1 (immature)	76	34	12	11	3	6	21	33	10	38	1	5
2	*Arachosia* sp						1			1			
3	*Osoriella tahela* (Brescovit, 1998)						4						3
4	*Pippuhana* sp									2			
5	*Xiruana tetraseta* (Mello-Leitão, 1937)					1							
	ARANEIDAE *(orb web)*												
6	*Alpaida* sp			1									
7	*Argiope* sp				1								
8	*Cyclosa* sp			1									
9	*Micrathena* sp							1					
10	Araneidae sp 1										2		
11	Araneidae sp 2		1			2						2	1
	CORINNIDAE *(foliage runners)*												
12	*Trachelopachys* Simon, 1897 sp					5	9					4	5
	DICTYNIDAE *(space web builders)*												
13	*Dictyna* sp			1	2					1			
	GNAPHOSIDAE *(ground runners)*												
14	*Cesonia* sp								1				
15	*Eilica* sp											1	
16	*Vectius niger* (Simon, 1880)										1		
17	*Xenoplectus* sp											1	
	LINYPHIIDAE *(wandering sheet)*												
18	*Neriene redacta* (Chamberlin, 1925)								1				
19	*Sphecozone* sp 1	9	3	10	3				2				
20	*Sphecozone* sp 2	32	9										
	MIMETIDAE *(stalkers)*												
21	Mimetidae sp									1	1		
	MITURGIDAE *(foliage runners)*												
22	*Cheiracanthium inclusum* (Hentz, 1847)		3		1	2	1				5		1
	OXYOPIDAE *(stalkers)*												
23	Oxyopidae sp 1	1					1						2
24	Oxyopidae sp 2												1
25	*Oxyopes salticus* (Hentz, 1845)	5	4		3	6	2	5	1	5	1	1	
	OONOPIDAE *(ambushers)*												
26	Oonopidae sp											1	
	PHILODROMIDAE *(ambushers)*												
27	*Berlandiella* sp		2			2	12					7	6
	PHOLCIDAE *(space web)*												
28	Pholcidae sp										1		
	SALTICIDAE *(stalkers)*												
29	*Agelista* sp	3	2										
30	*Chira* cf *guianensis* (Taczanowski, 1871)				1		2	1					
31	*Chira lanei* Soares and Camargo, 1943										1		
32	*Chira* sp 1			1			1				3	8	1
33	*Chira* sp 2	1	2						3		2		
34	*Corythalia* sp				1								
35	*Cylistella* sp		1			3	3	1	6		2		1

[1] Identification species number.

Table 3 (Continued)

id	Araneae (Taxa)	GT1	GS1	GT2	GS2	GT3	GS3	VT1	VS1	VT2	VS2	BT3	BS3
36	*Dendryphantes* sp	4				1			3			1	
37	Dendryphantinae (Gen 1)									1			
38	Dendryphantinae (Gen 2)		3										
39	Evophryinae sp 1				2	1	2			1	3	5	3
40	Evophryinae sp 2					3						1	
41	*Frigga* sp				1			1			1		
42	*Helvetia* sp				4								
43	*Lurio* sp					2							
44	*Maeota dichrura* Simon, 1901					1	1			1			1
45	*Sassacus* sp1												4
46	*Sassacus* sp2				1	1						1	1
47	*Sidusa* sp					11	6					5	
48	*Synemosyna* sp	1											
49	*Tariona* sp					2	8					2	5
50	*Thiodina vaccula* Simon, 1900	1			3	1	5		1	2			3
51	*Wedoquela punctata* (Tullgren, 1905)				1	1						4	1
	SCYTODIDAE *(space web)*												
52	*Scytodes fusca* (Walckenaer, 1837)			1			2					1	2
	SELENOPIDAE *(ambushers)*												
53	Selenopidae sp *(ambushers)*			1			1						
	SENOCULIDAE												
54	Senoculidae sp				1		1						
	SPARASSIDAE *(ambushers)*												
55	*Olios* sp	1	1						1				
56	*Polybetes* sp	1									1		
	TETRAGNATHIDAE *(orb web)*												
57	*Leucauge* sp		1			3	3		2	1		2	2
	THERIDIIDAE *(space web)*												
58	*Achaearanea* sp	2		2	1			1	7	1	10		
59	*Achaeranea hirta* (Taczan., 1873)									1			
60	*Anelosimus rupununi* Levi, 1956							1					
61	*Argyrodes elevatus* Taczan., 1873								1				
62	*Argyrodes longissimus* (Keyserling, 1891)						1						
63	*Crysso pulcherrima* (M.-Leitão, 1917)	2	4	4	3	3	10					5	14
64	*Dipoena atlantica* (Chickering, 1943)											2	2
65	*Dipoena cordiformis* (Keyserling, 1886)						1					1	1
66	*Dipoena* sp					4	1				2		1
67	*Episinus* sp			2			5				1	1	1
68	*Euryopis* sp				2					3			
69	*Theridion tinctorium* Keyserling, 1891	1	1										1
70	*Twaithesia* 1881											1	
	THOMISIDAE *(ambushers)*												
71	*Misumenops pallida* (Keyserling, 1880)				1			1		1	1		
72	*Misumenops argenteus* (Mello-Leitão, 1929)		1	2	3		1				1		
73	*Synema* sp					2			12				
74	*Tmarus* sp	5	3		3	18	5	1	10	4	3	6	8
	TITANOECIDAE *(vagrant weaver)*												
75	*Goeldia* sp				2	1	1						1

species (N > 20 individuals) were *Tmarus* sp, *Chrysso pulcherrima*, *Sphecozone* spp, *Achaearanea* sp, *Sidusa* sp, *Berlandiella* sp, *Oxyopes salticus*, and *Thrachelopachys* sp (Table 3).

Hunters were the dominant spider guild in the three cerrado patches. Foliage runners and stalkers were two of the principal guilds found in all the patches, the former being frequent in Pirassununga and São Carlos and the latter in Luís Antônio (Fig. 2). Ground-running spiders were found only in Luís Antônio (Fig. 2).

Ordination by correspondence analysis using the abundance of the 30 more representative spider species (5 individuals or more, identification number in bold in Table 3) showed separation among patches, mainly between Luís Antônio and the other two patches; and among *Myrcia* species (figure not shown). There were significant effect of patches (p=0.027) and of *Myrcia* species (0.046) on the ordination. The microhabitat factor (target tree or shrubs) was not important to explain the ordination (p=0.852). Further, an analysis of canonical correspondence was applied using the abundance of the 30 spider species and the two significant environmental factors. The results showed that the first two axes explained about 48% of the spider species-habitat variation (inertia) and all axes explained about 61% (p=0.001). The ordination diagram for the first two axes is presented in Figure 3. The first CCA axis is related to patches local. São Carlos had the lowest and Luís Antônio the highest scores, with Pirassununga in the between, very close to the first. That suggests that the first axis is related to plant density. The second CCA axis is related to *Myrcia* species. In general *M. guianensis* had the lowest and *M. velunosa* the highest scores for São Carlos and Pirassununga. The two *Myrcia* species in Luís Antônio did not separated too much. *Chira* sp 2 (33), *Achaearanea* sp (58) and *Synema* sp (73) were associated with *M. venulosa* while *Sphecozone* sp 1 (19), *Sphecozone* sp 2 (20), *Agelista* sp (29) and *Misumenops argenteus* (72) were associated with *M. guianensis*, all of them associated with São Carlos (1) and Pirassununga (2) patches. *Sphecozone* sp 2 (20), *Agelista* sp (29) appeared exclusively in and around *M. guianensis*. The spiders *Dipoena* sp (66), *Chira* sp 1 (32), Araneidae sp 2 (11), *Scytodes fusca* (52), *Wedoquela punctata* (51), *Berlandiella* sp (27), *Sidusa* sp (47), *Osoriella tahela* (3), *Trachelopachys* (12) and *Tariona* sp (49) were associated to Luís Antônio (3). *Wedoquela punctata* (51) was particularly associated to *M. bella* and *Araneidae* sp 2 (11), *Trachelopachys* sp (12), *Tariona* sp (49), and *Sidusa* sp (47) appeared exclusively in Luís Antônio.

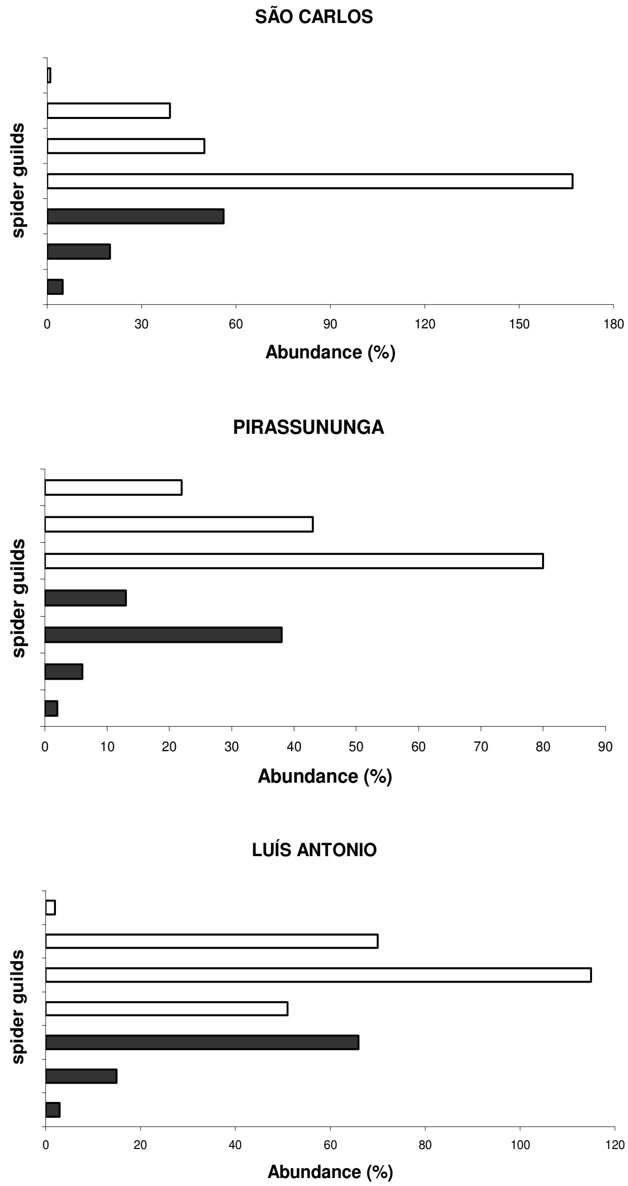

Fig. 2. Abundance percentage of spiders' guilds in three *Myrcia* species in three patches of cerrado in the State of São Paulo, Brazil.

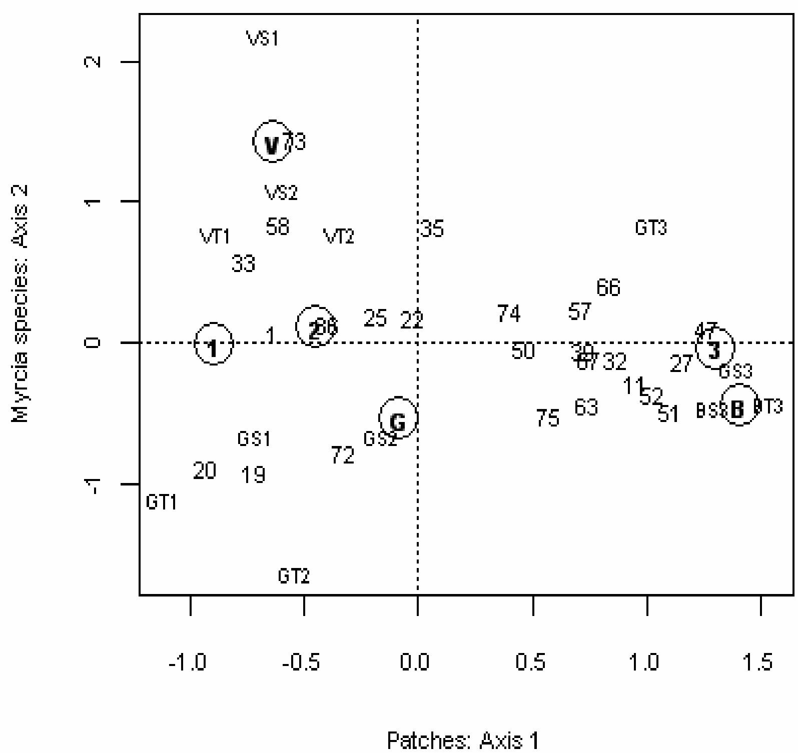

Fig. 3. Biplot of the first and second axes of a canonical correspondence analysis ordination of habitat groups in relation to species abundance distribution. Centroids of the scores for each level of the factors *Myrcia* species ('V', 'G' and 'B') and patch local ('1', '2' and '3') appear rounded by a circle. Scores for spider species 29 is at the same point as species 20; scores for species 68 is to close to species 36 and scores for species 3, 12 and 49 are all just behind centroid for local 3.

DISCUSSION

Abundant sunlight characterizes most cerrado, probably contributing to the prevalence of active foragers as foliage runners and stalkers in all habitats. It was verified by YOUNG & EDWARDS (1990) who suggested that the active wanderers are more tolerant of hot and dry situation. Weaving spider website selection is strongly influenced by humid microclimate (SAMU, SUNDERLAND & SZINETÁR, 1999), explaining why web-building spiders generally occurred in low numbers in cerrado.

Each cerrado patch examined here had particular characteristics, i.e., the factors that produced structure, spatial distribution of plants and floristic composition that in general make a spider fauna association between the community of plants (trees and shrub) more similar within than with other patches. In the cerrado patches there are a grade in the plants groups and spatial distribution of the trees where Luís Antonio is the densest and São Carlos the less dense one. According SANO & ALMEIDA (1998) the arboreal density of cerrado is a consequence of edafic and hydro conditions and also the human influence. Based on a comparison of our results it can be concluded that the family composition of the spider fauna among the patches is rather similar, and there is a tendency of spiders species overlap an interregional level, i.e. trees and their shrub surrounding. BOGYA, MARKÓ & SZINETÁR (1999) found that the spider community show remarkable scale-dependent regional differences. Luís Antônio was distinctly separated from the other two areas (Fig. 3), probably due to this site's denser vegetation, the forested land surrounding it, and the exclusive presence of *Myrcia bella*.

However, the most similar spider assemblages living on woody vegetation occurred in *Myrcia venulosa* (1st quadrant in Fig. 3) and in *Myrcia guianensis* (4th quadrant in Fig. 3) at São Carlos and Pirassununga. In *M. bella* from Luís Antonio there were exclusively spider species (3th quadrant in Fig. 3). This interregional similarity indicates an association between some spiders and particular vegetation. The *venulosa* species is distinctly more ramified and its canopy much denser than the other two plant species. It seems to create poor structure for web-building species such as the abundant theridiid *Crysso pulcherrima* (63), while simultaneously supplying many perches and resting sites for ambushing, space web and wandering, such as, *Synema* (73)*, Achaearaneae* (58) and *Chira* sp 2 (33). By the other hand the spiders *Sphecozone* sp 2 (20) and *Agelista* sp (29) are exclusively found in *M. guianensis*. Like pointed CLOUDSLEY-THOMPSON (1962) plants are important modifiers of the microclimate for arthropods, specifically by moderating temperature and humidity extremes and by providing a more complex three- dimensional habitat. The active selection for suitable microhabitats (plant species) within a patch was demonstrated by RIECHERT & GILLESPIE (1986) (*apud* GUNNARSSON, 1990) and MAC NETT & RYPSTRA (2000). The same was observed for spiders with ambushing strategy, like thomisids, as evaluated by MORSE AND FRITZ (1982). Manipulative studies have demonstrated that the kinds and numbers of spider species found in an area are strongly influenced by vegetation diversity and complexity (ROBINSON, 1981;GUNNARSSON, 1990; SUNDBERG & GUNNARSSON, 1994, WISE,1993; HEIKKINEN & MAC MAHON, 2004). Also the differences in the size and phenological stage of the plants promote variations in the spider species and spider abundance (VISSER *et al.* 1999, STUNTZ *et al*. 2002, ROMERO &

Vasconcellos-Neto, 2005). Many environmental factors influence the composition of animal assemblages. For spider assemblages, plant architecture is an important variable. All of those studies on association spider species and plants considering one kind of plants or artificial shrubs. In relatively large and distant patches with a complex and diverse vegetation, as the cerrado, it was also possible to demonstrate that spiders select suitable microhabitats.

It is critical to acquire more data on the inhabitants of the endangered cerrado biome in an attempt to conserve the remaining areas of this rapidly-disappearing center of biological diversity. Establishment of sufficiently-sized and adequately configured conservation areas require intimate knowledge and understanding of species' compositions and interactions. Spiders represent a key group of terrestrial predators, making them a valuable and important target for conservation studies. Their position in food webs (a "trophic node", Cady & Halaj, 1998) permit insights into energy flow through ecosystems. More studies of basic spider ecology are required to reach conservation goals.

SUMMARY

Brazilian cerrado is a biologically-rich, poorly understood, yet rapidly disappearing habitat. Composition of the spider assemblages from areas of cerrado from three separate sites in the State of São Paulo, Brazil were sampled by beating the canopies and adjacent shrubs of three *Myrcia* (Myrtaceae; "myrtle") tree species. These produced a total of 859 spiders belonging to 21 families and 75 species. The most undisturbed and densest cerrado habitat had the largest number and greatest diversity of spider species, encompassing stalkers, ambushers, space web-weavers, and foliage runners. The other two areas were dominated by foliage runners. Spider distribution in this natural and complex habitat was evaluated by classifying the samples into 12 habitat/microhabitat groups according to local of the patch, tree species, and microhabitat (target tree or adjacent shrub). Correspondence analysis was used for ordination of species and groups based on their abundance. Environmental factors such as patches type (p=0.027) and plant species (p=0.046) had significant effects in explaining the ordination. Canonical correspondence analysis was applied for relating the patterns in species richness and/or abundance to the significant environmental factors. A comparison of the results showed that the family composition among the patches is rather similar, and there is a tendency of spiders species overlap an interregional level (patches effect, p=0.027). However, the most similar spider assemblages living on woody vegetation occurred in *Myrcia venulosa* and *Myrcia guianensis* at São Carlos and Pirassununga, demonstrating an interregional similarity (plant species effect, p=0.046) that indicates an association between spiders and particular vegetation.

KEY WORDS: Biodiversity; spider-assemblage; community; *Myrcia;* Myrtaceae.

SUMÁRIO

O cerrado brasileiro é um habitat biologicamente rico, pouco estudado e que está desaparecendo rapidamente. Assembléias de aranhas de áreas do cerrado de três locais separados no Estado de São Paulo, Brasil, foram amostradas pela batida das copas de três espécies de *Myrcia* (Myrtaceae), e subbosques adjacentes. Isto totalizou 859 aranhas pertencentes a 21 famílias e 75 espécies. A mancha de cerrado mais densa e menos perturbada teve o maior número de espécies de aranhas predominantemente perseguidoras, caçadoras de emboscada, tecelãs tridimensionais, e corredoras em folhagem. Nas outras duas áreas predominaram as corredoras de folhagem. A distribuição de aranhas neste habitat natural e complexo foi avaliada pela classificação das amostras em 12 grupos de habitat/microhabitat, de acordo com o local da mancha de cerrado, as três espécies de *Myrcia* e o microhabitat (árvores-alvo ou subbosque adjacente). A análise de correspondência foi usada para a ordenação das espécies e grupos baseados na abundância de aranhas. Fatores ambientais tais como, tipo de mancha (p= 0.027) e espécie da planta (p= 0.046) tiveram efeitos significativos na explicação da ordenação. A análise de correspondência canônica foi aplicada para relacionar os padrões de riqueza de espécies e/ou abundância para fatores ambientais significativos. A comparação dos resultados mostrou que a composição das famílias de aranhas entre manchas é bastante similar e há uma tendência das espécies de aranhas sobreporem-se no nível interregional (efeito de manchas, p = 0,027). Contudo, as mais similares assembléias de aranhas que vivem nas árvores, ocorreram em *M. venulosa* e *M. guianensis* em São Carlos e Pirassununga, demonstrando similaridade regional (efeito da espécie de planta, p = 0,046), o que indica, uma associação entre aranhas e tipo de vegetação.

PALAVRAS-CHAVE: biodiversidade; assembléia-aranhas; comunidade; *Myrcia;* Myrtaceae.

RÉSUMÉ

Le *cerrado* brésilien constitue un habitat biologiquement riche, peu étudié et en voie de disparition. Des peuplements d'araignées du *cerrado* de trois sites différents et séparés de l'État de São Paulo, Brésil, ont été échantillonnées en secouant les branches de trois espèces de *Myrcia (*Myrtaceae), ainsi que des sous-bois adjacents. On a recuperé 859 araignées appartenant à 21 familles et 75 espèces. La tache de *cerrado* la plus dense et moins perturbée avait la plus grande abondance d'espèces d'araignées, surtout des araignées salticides, des chasseresses à l'affût, des fileuses tridimensionnelles, et des coureurs du la feuillage Dans les deux autres sites prédominaient les coureurs du la feuillage. La distribution des araignées dans cet habitat naturel et complexe a été évalué par le classement des échantillons en 12 groupes d' habitat / micro-habitat, selon la localisation de la tache de *cerrado*, les trois espèces de *Myrcia* et le micro-habitat (arbres-cybles ou sous-bois adjacent). L'analyse des correspondances a été utilisée pour l'ordination des espèces et des groupes basés sur l'abondance d'araignées. Des facteurs environnementaux tels que le type de tache de *cerrado* (p=0,027) et l'espèce de la plante (p=0,046) ont montré des effets significatifs pour l'explication de l'ordination. Les relations entre les patrons de richesse en espèces et/ou l' abondance des facteurs environnementaux significatifs ont été examinées à l'aide de l'analyse canonique des correspondances. La comparaison des résultats montre que la composition des familles d'araignées entre les taches est assez similaire et qu'il y a une tendance des espèces d'araignées à se superposer dans un niveau inter-régional (effet de taches, p = 0,027). Néanmoins, les peuplements d'araignées les plus similaires vivant sur les arbres ont eu lieu sur *M. venulosa* et *M. guianensis*, à São Carlos et à Pirassununga, montrant une similarité régionale (effet de l'espèce de plante, p = 0,046), ce qui indique une association entre des araignées et un type de végétation.

MOTS CLÉS: biodiversité; assemblage-d'araignées; peuplement d'araignées; *Myrcia;* Myrtaceae.

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