



STUDY ON DIVERSITY OF SPIDERS FROM BANGALORE UNIVERSITY CAMPUS, BENGALURU, INDIA.

Zoology

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ABSTRACT

An attempt is hereby made to explore the spider fauna of Bangalore University campus, from June 2019 to January 2020. A total of 52 species of 32 genera of 13 families were studied. The dominant families were Araneidae (22 species), Salticidae (8 spp.), Oxyopidae (5 spp.) and Pholcidae and Lycosidae (3 spp each.). A total of six guild structures of spiders were observed. Among these Orb weavers (50%) were most dominant group followed by Jumpers (15%), Scattered line weavers, Ground runners and stalkers were (9 %) each, and Ambushers (5%) was least dominant group. The data throws light on rich diversity of spiders in campus which is attributed to varied habitats and ecological niches.

KEYWORDS

Spider, Diversity, Guilds and Bangalore University.

INTRODUCTION:

Spiders (Arthropoda: Arachnida: Araneae) are fascinating and most diverse group of air breathing chelicerate arthropods in the animal kingdom. Their distribution is worldwide except Antarctica and occupies every ecological niche available except of air and sea colonization. According to Platnick, the order Araneae possesses 114 families, 3935 genera and 44,906 species. However currently there are 791 cytogenetic records in spiders from the world. They make largest order of Arachnids and rank seventh in the total species diversity among all other groups of organisms. ^[1] A total of 2,299 species of spiders from 67 families have been reported from South Asia. ^[2] A total of 1,686 species belonging to 438 genera of 60 families were recorded from India. ^[3] Pocock ^[4] and Tikader ^[5] have given a baseline data on diversity of Indian spider fauna. Many workers have made some of significant contributions in spider fauna of Karnataka. ^[6-11] From Mangalore University campus, Mangalore about 32 species of spiders was reported. ^[12] Data thus collected may facilitate future initiatives of biodiversity data base of these species in said region. The aim of this study is to throw light on spider biodiversity of area and also to understand their potential as bioindicators of the region.

MATERIALS & METHODS:

Study area: Bangalore lies in the south east of the South Indian state of Karnataka. It is in the heart of the Deccan plateau at an average elevation of 900m. It is located at 12.97° N, 77.56° E and covers an area of 2,190 square kilometers (850 sq. m). Situated at a height of 949 meters above the sea level, the city is blessed with salubrious climate throughout the year. This region experiences a Tropical savannah climate with distinct wet and dry seasons, and has a relative humidity ranging from 40-95%. Due to its high elevation, the Bangalore region usually enjoys a more moderate climate throughout the year. The habitat of Jnana Bharathi campus of Bangalore University which was the study area has an area of 486 hectares and located in the southwest of Bangalore. It is an isolated serene place with diverse habitats comprising of mixed deciduous trees, Shrubs, Bamboo thickets, Marshes, Check dams and Mini parks. It includes thick vegetation with diverse flora and fauna.

Sampling:

The study was conducted from June 2019 to January 2020. Sampling was conducted every alternate day from 9 to 10 am and 5 to 6 pm. There are various methods of collecting spiders which depends on the environment and habitat from where the spiders have to be collected. The type of vegetation often determines the kind of spider's present. The spiders were collected using standard methods such as jarring, Hand picking, inverted umbrella method, by sweep net and kerchief method.

Identification and photography: The collected spiders were identified with the help of catalogue. ^[13] Live photographs of all-important spiders were taken with the help of webcam of 12 megapixel, for taking live photographs, the spiders were anesthetized with mild doses of chloroform in specimen tubes. Generally major diagnostic features such as Dorsal view, Ventral view, ocular area and side view were taken for the study. Natural photographs of spider were taken while they were feeding.

RESULTS AND DISCUSSION:

The Spider fauna of India is represented by 1520 spiders species belonging to 377 genera and 60 families. ^[14] The spider diversity of Bangalore University (Jnana Bharathi Campus) is found to be rich. The study revealed the occurrence of 52 species of spiders belongs to 32 genera of 13 families. Out of 52 species recorded 22 species belongs to family Araneidae, 8 species belong to family Salticidae, 5 species of family Oxyopidae, Lycosidae and pholcidae having 3 species each, 2 species belong to each family Tetragnathidae, Thomisidae and Theridiidae and Hersiliidae, Agelenidae, Sparassidae, Uloboridae, Gnaphocidae were represented by single species each (Table- 1). As such the university campus has various thick vegetation gardens so they supported the rich diversity of spiders in the study area. Out of the total diversity recorded, the family Araneidae was the most dominant with 42%, Salticidae 15.15%, Oxyopidae 9%, Lycosidae and pholcidae 5% each, Tetragnathidae, Thomisidae and Theridiidae 3.8% each, Hersiliidae, Agelenidae, Sparassidae, Uloboridae, Gnaphocidae with 2% each respectively.

The spiders of Bangalore University were noticed with the following foraging behaviour. The Orb web weavers (Araneidae, Agelenidae, Tetragnathidae, Uloboridae), Ground runners (Lycosidae, Gnaphocidae Sparassidae), Stalkers (Oxyopidae), Jumpers (Salticidae), Ambushers (Hersiliidae, Thomisidae), Scattered line weaver (Theridiidae, Pholcidae) (Table- 2). Among these Orb weavers were dominant with 50% of species, followed by Jumpers (15%), Stalkers (9%), Ground runners (9%), Scattered line weavers (9%), Ambushers (5%) (Fig. 1). They have been reported to occur as abundant as 1000 animals per square meter and exhibit a variety of foraging strategies by which they exert control over other invertebrate populations in varying ecological habitats. ^[15] Spiders select habitat in such a way that they benefit in various forms to reduce inter specific competition within its communities. ^[16,17] Diversity generally increases when a greater variety of habitat types are present. ^[18,19]

Table 1. List of different Spider species found in Bangalore University campus.

Family	Species	No. of Species
Araneidae	<i>Argiope aemula</i> (Walckenaer, 1842)	22
	<i>Argiope anasuja</i> (Thorella, 1887)	
	<i>Argiope pulchella</i> (Thorella, 1881)	
	<i>Argiope</i> sp. (Audouin, 1826)	
	<i>Acacesia</i> sp	
	<i>Cyclosa confragra</i> (Thorell, 1892)	
	<i>Cyclosa bifida</i> (Dollescall, 1859)	
	<i>Cyrtophora cicatrosa</i> (Forskerl, 1775)	
	<i>Cyrtophora citricola</i> (Stoliczka, 1869)	
	<i>Cyrtophora molluciensis</i> (Dollescall, 1857)	
	<i>Hernnia multipuncta</i> (Dollescall, 1859)	
	<i>Neoscona mokerjei</i> (Tikader, 1980)	
	<i>Neoscona nautical</i> (Taczanowski, 1873)	
	<i>Neoscona odites</i> (Simon, 1906).	

	<i>Neoscona molemensis</i> (Tikader & Bal, 1981)	
	<i>Neoscona</i> sps	
	<i>Nephila kuhlui</i> (Doleschall, 1959)	
	<i>Nephila</i> sps	
	<i>Nephila clarota</i> (L Koch, 1878)	
	<i>Nephila pilipes</i> (Fabricius, 1793)	
	<i>Parawixia dehaani</i> (Doleschall, 1859)	
	<i>Ordgarius</i> (Keyserling, 1886)	
Agelenidae	<i>Agelenopsis</i> sp.	1
Gnaphocidae	<i>Gnaphocidae</i> sp.(Pocock, 1898)	1
Hersiliidae	<i>Hersilia sarignyi</i> (Lucas, 1836)	1
Lycosidae	<i>Arctosa</i> sps.(Tikader & Malhotra, 1980)	3
	<i>Hippasa agelenoides</i> (Simen, 1884)	
	<i>Hippasa greenalliae</i> (Blackwell, 1867)	
Oxyopidae	<i>Oxyopes birmanicus</i> (Thorell, 1887)	5
	<i>Oxyopes javanus</i> (Thorell, 1887)	
	<i>Oxyopes lineatus</i> (Latreille, 1806)	
	<i>Oxyopes Shwetha</i> (Tikader, 1970)	
	<i>Peucetia viridana</i> (Stoliczka, 1869)	
Pholcidae	<i>Crossopriza lyoni</i> (Blackwall, 1867)	3
	<i>Pholcus phalangeoides</i> (Fuesslin, 1775)	
	<i>Pholcus</i> sp.	
Salticidae	<i>Menemerus bivittatus</i> (Dufres, 1831)	8
	<i>Plexippus paykulli</i> (Audouin, 1826)	
	<i>Plexippus petersi</i> (Karsh, 1878)	
	<i>Rhene</i> sps. (Thorella, 1869)	
	<i>Hyllus semicupreus</i> (Simon, 1885)	
	<i>Telamonia dimidiata</i> (Simon, 1899)	
	<i>Myrmarchne plataleoides</i> (O. P. Cambridge, 1869)	
	<i>Servaea</i> sp.	
Sparassidae	<i>Heteropoda</i> sps. (Latreille, 1804)	1
Tetragnathidae	<i>Tetragnatha</i> sps. (Menge, 1866)	2
	<i>Tetragnatha</i> sp.	
Theridiidae	<i>Theridion manjithar</i> (Tikader, 1970)	2
	<i>Achaeranea</i> sp.(Strand, 1929)	
Thomisidae	<i>Thomis</i> sps. (Sundreal, 1833)	2
	<i>Runcinia afinis</i> (Simon, 1897)	
Uloboridae	<i>Uloborus</i> sps. (Thorella, 1869)	1

Table 2. Genera and Species of Spider Distribution in Bangalore University campus

Sl no.	Family	Genera	Species	Guild Structures
01	Araneidae	9	22	Orb weavers
02	Agelenidae	1	1	Orb weavers
03	Gnaphocidae	1	1	Ground runners
04	Hersiliidae	1	1	Ambushers
05	Lycosidae	2	3	Ground Runners
06	Oxyopidae	2	5	Stalkers
07	Pholcidae	2	3	Scattered line weavers
08	Salticidae	7	8	Jumpers
09	Sparassidae	1	1	Ground Runners
10	Tetragnathidae	1	2	Orb Web Weavers
11	Theridiidae	2	2	Scattered line weavers
12	Thomisidae	2	2	Ambushers
13	Uloboridae	1	1	Orb Web Weavers
Total	13 Family	32 Genera	52 Species	

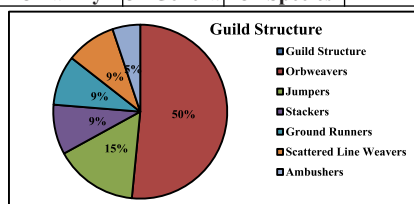


Figure 1. Type of Guilds found in Bangalore University Campus

CONCLUSION:

From the present study it has been concluded that Bangalore University Campus has a rich and wide diversity of spider species with 52 species belong to 32 genera of 13 families. A total of six guild structures of spiders based on foraging behavior were observed. It could be observed in the present study that the occurrence and abundance of the species collected is influenced by micro-climatic and related environmental parameters. Hence, it could be stated that species occurrence and perhaps their abundance is related to habitat preference of the species. . In the context of unabated deterioration of habitats, these spiders could be assigned the status of indicators of environmental changes.

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