Indian J. Applied & Pure Bio. Special Vol. 2(1): 256-262 (2021). **ISSN: 0970-2091**
A web of Science Journal
National e-Conference on Biodiversity Building and Natural Resource Management (NC BBNRM) Date: 22nd-23rd, December, 2021

A study on the diversity of Spiders in different localities of Mysore city, Karnataka

M. Ramyashree and R. Anusha

Postgraduate Department of Zoology
JSS College of Arts, Commerce and Science Ooty Road, Mysore-570015 (India)
Email: m.ramyashree@gmail.com ;
Mob: 9620878716

Abstract

Spiders belong to the largest order Aranae of the class Arachnida Phylum Arthropoda. Spiders are important food source of many vertebrates such as birds, lizards, etc., and thus become an important part of various food chain and food web. The present study was undertaken to know the diversity of Spiders in three different study sites of Mysore city. The study sites were selected based on the anthropogenic activity. Field survey was conducted during March to May 2021 in the morning between 6:30 to 8:30 am. The observations were recorded according to visual count method and all out search method and standard methods were followed to identify the different species of spider. Total 41 species of spiders belonging to 18 families were recorded during the study period. The Araneidae family was the dominant family with highest number of species recorded followed by Salticidae and Lycosidae families. Family Linyphiidae, Pisauridae, Oxyopidae, Thomisidae and Nephilidae consists of two species respectively. Out of total diversity recorded, the family Araneidae was considered dominant with the relative abundance of 29% and Salticidae with 15% followed by Lycosidae 7%, Linyphiidae, Pisauridae, Oxyopidae, Thomisidae and Nephilidae 5% each, and Sparassidae, Uloboridae, Scytodidae, Theraphosidae, Hersiliidae, Tetragnathidae, Gnaphosidae, Oecobiidae and Dictynidae with 2% each. The present study is a basic research which gives a preliminary information on the diversity of spiders. Further detailed observation on how environment and vegetation plays a major role in sustenance of spiders in the natural system may have to be studied in a systematic way.

Spiders are arthropods called arachnids. They belong to the order Araneae of Phylum Arthropoda. Spiders are the largest groups of arachnids comprising of more than 30,000 species distributed over 60 families worldwide. They occupy an integral part of the ecosystem as a predator for many small insects and prey for many lizards, birds and wasps in food chain and food web[4,6,10]. Spiders are bioindicators which are important in controlling insect pests in most agricultural crops[7]. Similar types of studies were carried out by many researchers who have reported spiders belonging to different families. Shirbhate *et al.,*[11] has conducted a work on a diversity and distribution of work on spider fauna (Family -Araneidae) in and around the Katepurna Sanctuary, Akola India and reported spiders belonging to family Salticidae were more dominant represented by 11 genera and 11 species. Nalini Bai *et al*.,[5] surveyed on spider diversity in butterfly park of Bannerghatta National park, Bengaluru. They recorded a total of 42 species of spiders belonging to 36 genera under 17 families such as Amaurobiidae, Araneidae, Ctenidae, Corinnidae, Hersilidae, Lycosidae etc. Tabasum *et al.,*[12] have worked on spider diversity and composition along the Tungabhadra irrigation channel at Ballari, Karnataka. The study revealed the presence of 50 species belonging to 19 family were identified in and around Vijayanagara Sri Krishnadevaraya University, Ballari. Among them 12 species belong to Salticidae family followed by Araneidae (12), Pholcidae (5), Linyphiidae (3), Theridiidae (2), Tetragnathidae (2), Oxyopidae (2) etc. Bonte *et al.*,[2] investigated the impact of climate parameters such as temperature, humidity, and precipitation on spider diversity.

The survey on diversity of spider was carried out near footsteps of Chamundi hills, Dr. Rajkumar park and ManuVana parks of Mysore city. The average temperature is 33^{o}C and average rainfall is of 776.7mm. The study started from 1st of March 2021 to 31st of May. The selection of the study sites were natural ecosystem and manmade parks mainly based on the anthropogenic activity and the vegetation surrounded.

Sampling and Identification*:* Survey was conducted twice a month from March to May 2021. Spiders were photographed by adopting a standard sampling technique. Visual method and handpicked method were adopted for the purpose of observation and identification of the spiders. The spiders are carefully handpicked by using brushes, aspirators etc and therefore undamaged capture of spiders are ensured[5]. Photographs were taken using Redmi Note pro 8 with 15 megapixels auto focus rare camera without causing any damages to the physical parts of spiders. Spiders were then released safely to its natural habitat. The identification of spiders were done on the basis of morphological characteristics as per Tikader[13] & Sebastin *et al*.,[9].

In the present study a total of individuals belonging to 18 family and 41 species (Table-1) were identified. The relative abundance of Spiders belonging to the family Araneidae, Salticidae, Linyphiidae, Lycosidae, Pisauridae, Nephilidae, Oxyopidae and Thomisidae were high compared to the spiders belonging to the family Sparassidae, Uloboridae, Scytodidae, Theraphosidae, Hersiliidae, Tetragnathidae, Gnaphosidae, Oecobiidae Dictynidae and Pholcidae. Out of the 18 families

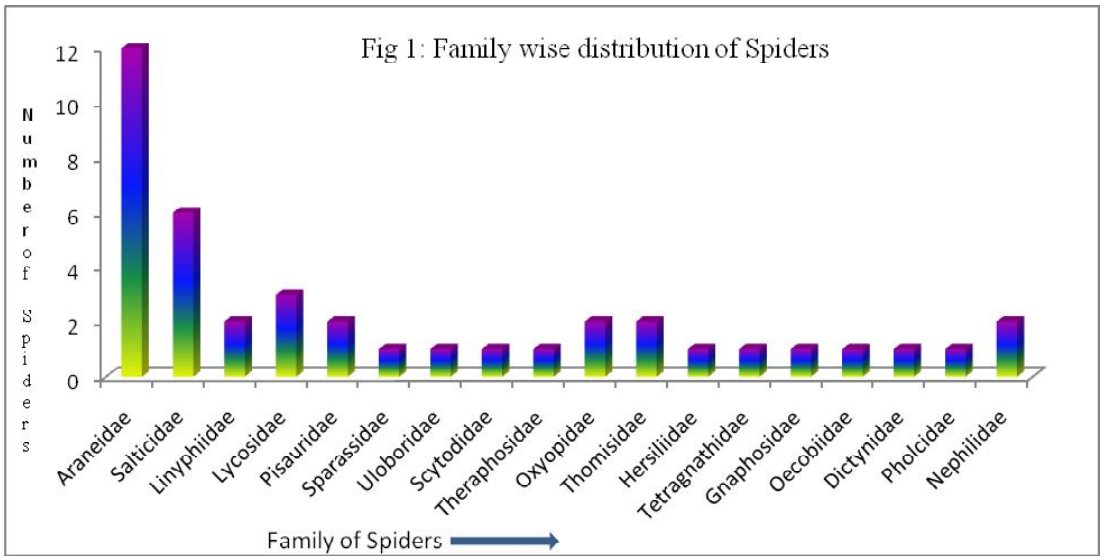

Plate 1: Spiders recorded in the study area

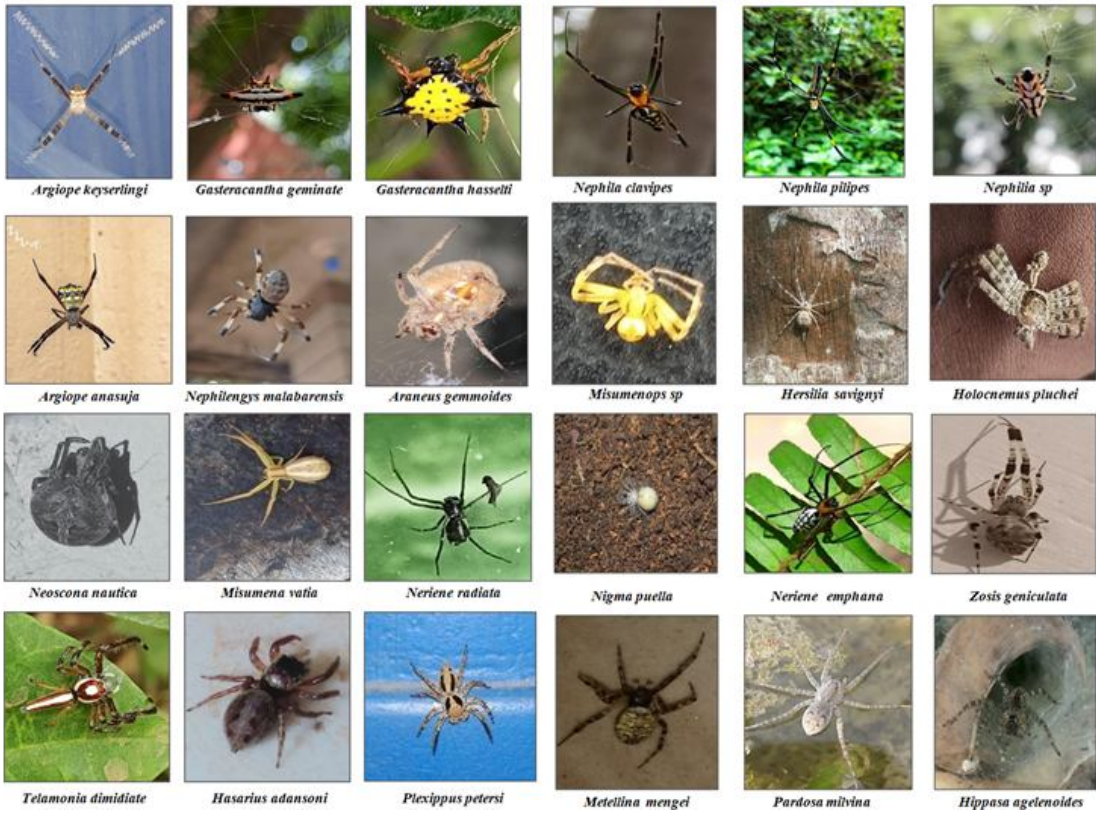

Table-1. Checklist of Spiders in the study sites

Sl.no	Family	Species name	Site 1	Site 2	Site 3
1	Araneidae	*Gasteracantha geminata*	+	-	-
2		*Argiope anasuja*	+	-	-
3		*Argiope keyserlingi*	+	-	-
4		*Araneus gemmoides*	+	+	-
5		*Gasteracantha hasselti*	+	-	-
6		*Nephilengys malabarensis*	+	-	-
7		*Argiope aetherea*	-	+	-
8		*Nephila pilipes*	+	-	-
9		*Austracantha minax*	-	+	+
10		*Argiope amonena*	-	-	+
11		*Neoscona adianta*	+	-	-
12		*Neoscona nautica*	-	-	-
13	Salticidae	*Telamonia dimidiata*	+	+	+
14		*Hasarius adansoni*	+	-	-
15		*Plexippus paykulli*	+	-	-
16		*Plexippus petersi*	+	-	+
17		*Menemerus bivittatus*	+	-	+
18		*Myrmarachne japonica*	-	-	-
19	Linyphiidae	*Neriene radiata*	+	+	-
20		*Neriene emphana*	+	-	-
21	Lycosidae	*Pardosa milvina*	-	+	-
22		*Amarobus anadamannsis*	+	+	+
23		*Hippasaa gelenoides*	+	-	-
24	Pisauridae	*Dolomedes scriptus*	-	+	+
25		*Dolomedes tenebrosus*	-	+	+
26	Sparassidae	*Heteropoda venatoria*	+	-	-
27	Uloboridae	*Zosis geniculate*	+	-	-
28	Scytodidae	*Scytodes globula*	-	+	-
29	Theraphosidae	*Chaetoplma olivaceum*	-	+	-

30	Oxyopidae	*Oxyopes*	-	-	+
31		*Oxyopes macilentus*	-	-	+
32	Thomisidae	*Misumenops* sp	+	-	-
33		*Misumena vatia*	-	-	+
34	Hersiliidae	*Hersilia savignyi*	+	+	-
35	Tetragnathidae	*Metellina mengei*	+	-	-
36	Gnaphosidae	*Gnaphosa sericata*	-	+	+
37	Oecobiidae	*Oecobius navus*	-	-	+
38	Dictynidae	*Nigma puella*	+	-	-
39	Pholcidae	*Holocnemus pluchei*	+	-	-
40	Nephilidae	*Nephila clavipes*	+	-	-
41		*Nephilia* sp	-	-	-

recorded the species diversity of spiders were dominant in the family Araneidae representing 29% followed by family Salticidae with 15%, Lycosidae 7%, Linyphildae, Pisauridae, Nephilidae, Oxyopidae and Thomisidae 5% each (Fig. 1). A checklist of spiders belonging to different families in all the three different study areas is represented in Table-1.

Table-1 represents the occurrence of spiders in different study sites. 25 species of spiders were recorded in Site 1 and 13 species were recorded both in site 2 and site 3 respectively. The relative abundance of spiders were more in site 1 compared to site 2 and site 3 where the anthropogenic activity is less. The relative abundance of spiders in family Araneidae was found to be 32%, 23% and 15% in Site 1, Site 2 and Site 3 respectively. Site 1 was devoid of species belonging to Pisauridae, Scytodidae, Theraphosidae, Oxyopidae, Gnaphosidae and Oecobiidae. Similarly Site 2 was devoid of Sparassidae, Uloboridae, Oxyopidae, Thomisidae, Tetragnathidae, Oecobiidae, Dictynidae, Pholcidae and Nephilidae. Site 3 was devoid of Linyphiidae, Sparassidae, Uloboridae, Scytodidae, Theraphosidae, Hersilidae, Tetragnathidae, Dictynidae, Pholcidae and Nephilidae.

Spiders play a major role as bioindicators of the natural habitats and as they are mainly placed under predaceous organism in the Animal Kingdom[1,8], they also have role in balance of nature[15]. In the present study spider were collected in three different habitat structures (S1, S2, S3). Among these, Site 1 had a highest distribution of spider species. This habitat showed rich floral and faunal (moths,

flies and ants) diversity which is a main factor to create a microhabitat for wide variety of spider species. The vegetation and the physical structure of the environment such as weather factors of the study area influence on the diversity of spiders[3,4]. Thus study site 1 (Footsteps of Chamundi hills) serves all the necessary demands for the sustenance of spiders in that ecosystem. Diverse and complex vegetation is helpful for the spiders to create its micro-environment, thus a wide range of vegetation is helpful for the spider diversity[6,8,10,14] which is in accordance with the results obtained. Dr. Rajkumar Park (Site 2) and Manu vana park (Site 3) occupies second place in the survey with 13 individuals in each study site belonging to 9 and 8 families respectively. When compared to study site 1 these parks are well maintained where the anthropogenic activity is more, which experience more habitat destruction, predatory disturbance and human interferences. As spiders are more sensitive to minor changes in their habitat structure and microclimate the population of spiders in these study sites may be decreased[7,10].

The present study is a base for further research in the area of diversity of spiders, which gives a broad spectrum details about the diverse species of spiders present in the selected study sites. Further species belonging to 18 families were identified which is a significant results with relatively diverse species of spiders in the study site 1 (Footsteps of Chamundi hills) which indicates about the more complex vegetation in the study area.

The authors are thankful for the JSS Mahavidyapeetha, Principal and Chief Executive JSS College of Arts, Commerce and Science, Ooty road Mysore for their support to carry out this research work.

Refrences :

1. Avila C.A., C. Stenert, L.N.E. Rodrigues and L. Maltchink (2017). *Ecological Society of Japan. 32:* 359-367.
2. Bonte D., L. Baert, and J. Maelfait (2002). *Journal of Arachnology. 30:* 331–343.
3. Kokilamani A. L. and P. Lokeshkumar, B.O. Rakesh, R. Sahana and H.C. Geetha (2019) *International journal of Advanced Scientific Research and Mangement, 4*(2): ISSN 2455-6378.
4. Mubeen M. and S. Basavarajappa (2018) *IOSR Journal of Pharmacy and Biological Sciences, 13* (3): pp-31-40.
5. Nalini Bai G. and B.P. Ravindranatha, (2012). *Indian Society of Archnology,* ISSN 2278-1587.
6. Nijagal B.S., S. Padma, Anju Michael., and Lorita D'Souza (2020). *IOSR Journal of Pharmacy and Biological Sciences, 15*(3): pp-23-29.
7. Prashanthakumara S.M., B.S. Nijagal and M. Venkateshwarulu (2015) Study on diversity of Spider fauna in Jnana Sahyadri campus, Shimoga, Karnataka, 34 (No1-2) pp 1-9.
8. Rajeevan S., M.K. Smiji, Thresiamma Varghese and P.K. Prasadan (2019). *South Asian Journal of Life Sciences* ISSN 2311-0589.
9. Sebastin P.A., M.J. Murugesan, A.V. Mathew, Sudhikumar and E. Sunish (2005).

European Arachnol. (Suppl. No. *1*): 315-318.

10. Sharma Shailendra, Amrita Vyas and Rekha Sharma (2010). Diversity and Abundance of spider Fauna of Narmada River at Rajghat (Barwani) (Madhya Prasesh) India. *2*(11) pp 1-5.
11. Shirbhate M.V and A.M. Shirbhate (2017). *Environment conservation journal 18*(3): 45-52.
12. Tabasum R. N., Nagaraj B, Subha Shantakumari, V Sreenivasa and Sai Sandeep Y (2018) *International Journal on Biological Sciences 9*(1): 36-44.
13. Tikader (1987). Handbook of Indian spiders. Zoological Survey of India. Kolkata, p 251.
14. Uetz G.W., (1991) Habitat structure and spider foraging. In : Bell S.S, McCoy ED, Mushinsky HR (eds) Habitat Structure: the physical arrangement of objects in space. Chapman and Hall, London. pp 325-348.
15. Young O.P and Edward B (1990). *Journal of Arachnology, 18:* 1-27.