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## Research Article

### DIVERSITY AND PLETHORA OF SPIDER FAUNA AT DIFFERENT HABITATS OF THE NILGIRIS, TAMILNADU SOUTH INDIA

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#### ABSTRACT

A original study was conducted to reveal the spider's diversity in the Nilgiris, Tamil Nadu. There were 59 species of spiders belonging to 25 genera of 11 families collected from Avalanche and Emerald valley. Emerald Valley and Parsons Valley of Nilgiris on the basis of distinguishing morphological characters and structure of the genitalia. Out of 59 species recorded in different study are as follows, Grass land, Wattle plantation, and Shola forest in three study sites. Maximum number of species were recorded in shola forest area compare than grass land and Wattle plantation. Spiders, like many invertebrates receive little attention from the conservation community. This may be due to fear and dislike of their appearance behaviors or noxious nature. Maximum richness was observed with respect to families Oxyopidae, Salticidae, Araneidae and Lycosidae. The present study showed significant variation in the population density among the different habitats but not in the species richness and diversity.

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#### INTRODUCTION

Spiders belong to the class Arachnida and like all arachnids, spiders have just two body parts, a cephalothorax and an abdomen. The abdomen is soft and unsegmented while the cephalothorax is harder and includes the eight legs that characterize spiders. Arachnids lack wings and antennae (Oyeniyi Abiola Oyewole, 2014). Most arachnids are carnivorous, typically preying on insects and other terrestrial organisms. Arachnids provide an important service, keeping insect populations under control. Spiders have helped in biological control of insects; without spiders some insects would have reached pest proportions.

Members of the order Araneae mainly prey on insects. However, spiders can only consume liquids, as they lack chewing mouthparts. They use chelicerae, pointed appendages at the front of the cephalothorax, to grasp prey and inject venom. Digestive juices break the food down into liquid, which can then be ingested by the spider. Araneae is the largest entirely carnivorous group of animals on the planet. Scientists have described over 75,000 species of arachnids with many more undescribed. Spider diversity, distribution and insectivorous feeding habits of spider are suspected of playing an important role in the balance of nature (Oyeniyi, 2014).

According to the latest version of World Spider Catalogue ver. 18 there are approximately 46777 species belonging to 4057 genera in 112 families. Tikader documented first comprehensive list of Indian spiders which was having 1067 spiders in 43 families belonging to 249 genera. Globally, the loss and degradation of natural habitats results in the loss of biodiversity and altered species distributions. This may disrupt ecosystem functions and constitute a major threat to the long-term biodiversity conservation.

Recently a total of 1686 species of spiders in 60 families belonging to 438 genera were listed in the checklist of Indian spiders by Keswani *et al*. The comparison of the above, last two documented comprehensive lists from India suggest reporting of 166 new species of spiders in a short span of three years. Diversity generally increases when a greater variety of habitat types were present. While lack of information in ecology and taxonomy of Indian Spiders however lowers the use of spiders as indicator species. Certain factors like distribution and relationship of them to the various habitats, and its responses to the different disturbance made difficult, using them as indicator species. This encouraged the arachnologists, for fresh intensive studies in India and neighboring countries to explore spider diversity.

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Spider fauna in The Nilgiris rich amount of spider diversity in decades. The present study aimed to investigate the spider fauna diversity in the Western Ghats of Nilgiris. It result will form a base, for further exploration of the spider fauna in rest of Nilgiris which is largely neglected so far. Diversity generally increases when a greater variety of habitat types were present (Dharmaraj J, 2017). To save spiders the utilization of pesticides must be banned minimized and agriculturists ought to be prepared about this. Indeed, even spiders can be utilized as biocontrol operators. It is conceivable if arachnids are raised by infestation of products. Luckily the life cycle of farming money crops coincides with the life cycle of spiders. Farmers can be prepared for rearing spiders that have high fertility. Spider fauna in The Nilgiris rich amount of spider diversity in decades. The present study aimed to investigate the spider fauna diversity in the Western Ghats of Nilgiris.

**Study area**

Geography of Nilgiris district is vast and it covers an area of 2452.50 square kilo meters. This district in the state of Tamil Nadu in India is located at an elevation of nine hundred to two thousand six hundred and thirty six meters above mean sea level. The latitudinal and longitudinal dimensions of this district are one hundred and thirty kilometers by one hundred and eighty five kilometers. This district of Tamil Nadu is bounded on the North by the state of Karnataka, on the West by the district of Coimbatore and Erode district, on the South by the Coimbatore district and Kerala and on the East by the state of Kerala. In the district of Nilgiris the topography is rolling and steep. Approximately sixty percent of the land under cultivation is under the slopes ranging from sixteen to thirty five percent. The total area covered by this district is 2452.50 square kilometers. As the district of Nilgiris is located at an elevation of 900-2236 meters above the mean sea level, during the summer season the climate remains to the maximum of 21 degree Celsius to 25 degree Celsius and the minimum of 10 degree Celsius to 12 degree Celsius. In the season of winter, the maximum temperature ranges from 16 degrees Celsius to 21 degree Celsius and the minimum of 2 degree Celsius. The Nilgiris district usually receives rain both during the South-West monsoon and North-East monsoon.



**Fig 1** Study area of the Nilgiris

The Gudalur, Pandalaur, Kundah and some portions of Udhamandalam taluk receive rain from the South-West monsoon and some part of Udhamandalam taluk and the

entire Kotagiri and Coonoor taluks are benefited by rain from the North-East monsoon. There are sixteen rainfall registration stations in this district of Tamil Nadu.

The average annual rainfall received by the Nilgiris district is 1920.80 mm. The Nilgiris is a horticulture district and the entire economy of the Nilgiris district depends upon the success and failure of horticulture crops like cabbage, potato, carrot, coffee, tea, spices and fruits. The main cultivation of this district is plantation crops which are coffee and tea. Potato and other vegetables are also raised in Coonoor and Udhamagai taluks.

Spider from Emerald Valley, Parsons valley, and Avalanche of the Nilgiris were collected from June 2016 to June 2017. Surveys were conducted every fortnightly to capture the spiders from the different habitats such as buildings, agricultural habitat (near the village), cultivated fields seasons. A survey was conducted in the early hours from 5 am to 9 am. The various methods used to capture the spiders were sweep net and visual searching in Agricultural area and forest. Spider collection and preservation methodology was followed according to Tikader. Spiders were preserved in rectified spirit with a few drops of glycerin in collection vials. Spiders were identified under Stereo-zoom microscope following standard taxonomic keys provided by Tikader, Tikader and Malhotra, Barrion and Litsinger, Jocque and Dippenaar – Schoeman, Gajbe and Sebastian and peter. The latest nomenclature of the identified species is based on the World Spider Catalog (2017).

**RESULT AND DISCUSSION**

This analysis identified species characteristic of each group of sites. A total of 59 species, belonging to 25 genera, under 11 families were identified from Avalanche, Emerald Valley and Parsons Valley of Nilgiris on the basis of distinguishing morphological characters and structure of the genitalia. A total of 5 species were reported from Salticidae, Pholcidae, Oxyopidae, and Araneidae. 11 Families were described representing 29% of 61 families in India. The most dominant family recorded during the present research was Araneidae. The last number of species was recorded in families Sparassidae, Tetragnathidae, Pholvidae, Agelenidae, Hersilidae.

Out of 59 species recorded in different study areas are as follows, Grass land, Wattle plantation, and Shola forest in three study sites. Maximum number of species were recorded in shola forest area compare than grass land and Wattle plantation. Spiders, like many invertebrates receive little attention from the conservation community. This may be due to fear and dislike of their appearance behaviors or noxious nature. A pioneering study was conducted to reveal the spider diversity in Nilgiris, Tamil nadu, India.

**Table 2** Relative distribution of the various spider species in the different study area

S. No	Spider Species	Grass land	Wattle Plantation	Shola forest
1.	<i>Araneus</i> spp.	+++	++	+++++
2.	<i>Argiopeanastuja</i> (Thorell, 1887)	-	-	+++
3.	<i>Argiopeulchella</i> (Thorell, 1881)	-	+	+++
4.	<i>Argiope</i> spp.	+	+	++++
5.	<i>Porcataraneusbengalensis</i> (Tikader,	+	++	++

6.	<i>Cyclosaconfra</i> (Thorell, 1892)	++	-	-
7.	<i>Cyrtophoracicatrosa</i> (Stoliczka, 1869)	+	+	+
8.	<i>Cyrtophoracitricola</i> (Forskal, 1775)	++	+	++++
9.	<i>Cyrtophoramoluccensis</i> (Doleschall, 1857)	-	-	+++
10.	<i>Eriovixialaglaizei</i> (Simon, 1877)	+	+	++
11.	<i>Neoscona</i> spp.	+	++	++++
12.	<i>Neoscona mukerjei</i> (Tikader, 1980)	+	+	-
13.	<i>Zygiella</i> spp.	++	++	++++
14.	<i>Clubionadrassodes</i> (O. P. Cambridge, 1874)	+	-	++
15.	<i>Castianeirazetes</i> (Simon, 1897)	+	+	++
16.	<i>Hersiliavignyi</i> (Lucas, 1836)	++	-	++
17.	<i>Linyphia</i> spp.	+	-	+++
18.	<i>Linyphiaurbasae</i> (Tikader, 1970)	-	+++	++
19.	<i>Hippasaagelenoides</i> (Simon, 1884)	+	++	+
20.	<i>Lycosa</i> spp.	++	++	++++
21.	<i>Pardosapseudoannulata</i> (Bosenberg & Strand, 1906)	-	-	++
22.	<i>Pardosasumatrana</i> (Thorell, 1890)	+	-	-
23.	<i>Cheiracanthium</i> spp.	+	++	+
24.	<i>Cheiracanthiumdanieli</i> (Tikader, 1975)	-	+	-
25.	<i>Cheiracanthiummelanostomum</i> (Thorell, 1895)	+	++++	+
26.	<i>Opopaea</i> spp.	-	+	-
27.	<i>Oxyopesbirmanicus</i> (Thorell, 1887)	-	+++	++
28.	<i>Oxyopesquadridentatus</i> (Thorell, 1895)	+	+++	++++
29.	<i>Oxyopesshweta</i> (Tikader, 1970)	-	-	++
30.	<i>Peuceiaviridana</i> (Stoliczka, 1869)	-	-	++
31.	<i>Herenniamultipuncta</i> (Doleschall, 1859)	-	-	++
32.	<i>Pisaurasp.</i>	+	+	+
33.	<i>Dendrolycosagitae</i> (Tikader, 1970)	-	++	-
34.	<i>Feceniaprotensa</i> (Pocock, 1899)	+	+++	++
35.	<i>Baviakairali</i> (Samson & Sebastian, 2004)	-	++	-
36.	<i>Brettusspp.</i>	+	++	+++
37.	<i>Brettusalbolimbatus</i> (Simon, 1900)	-	+	++
38.	<i>Carrhotusviduus</i> (C.L. Koch, 1846)	-	+	-
39.	<i>Chalcotropis</i> spp.	+	++	+
40.	<i>Hasariusadamsoni</i> (Audouin, 1826)	-	+	++
41.	<i>Hyllus semicupreus</i> (Simon, 1885)	-	+	-
42.	<i>Menemerusbivittatus</i> (Dufour, 1831)	-	+	++
43.	<i>Myrmarachneplataleoides</i> (O.P. Cambridge, 1869)	-	-	++
44.	<i>Myrmarachneramunni</i> (Narayan, 1915)	-	-	+
45.	<i>Phintellavittata</i> (C.L. Koch, 1846)	+	+	-
46.	<i>Plexippuspaykulli</i> (Audouin, 1826)	-	-	++
47.	<i>Plexippuspetersi</i> (Karsch, 1878)	+	+	-
48.	<i>Portia fimbriata</i> (Doleschall, 1859)	-	++	+++
49.	<i>Ptocasiusyashodharae</i> (Tikader, 1977)	+	-	-
50.	<i>Rhenedanieli</i> (Tikader, 1973)	-	-	++
51.	<i>Leucauge</i> spp.	-	-	+
52.	<i>Leucaugepondae</i> (Tikader, 1970)	-	-	+
53.	<i>Opadometafastigata</i> (Simon, 1877)	-	+	-
54.	<i>Tetragnathajavana</i> (Thorell, 1890)	-	-	+
55.	<i>Tetragnathamandibulata</i> (Walckenaer, 1842)	+	+	++
56.	<i>Tetragnathaviridorufa</i> (Gravely, 1921)	-	+	+
57.	<i>Theridion</i> spp.	-	+	-
58.	<i>Theridionmanjithar</i> (Tikader, 1970)	-	++	+
59.	<i>Theridulaangula</i> (Tikader, 1970)	-	+	++

'+' 5-10 individuals '++' 10-15 individuals '+++' 15-20 individuals '++++' 20-25 individuals '+++++' 25-30 individuals

Though India accounts with 1686 species of spiders, present report of 59 species recorded from the study area surveyed, accounts for 4.38% of reported Indian spider species, which is quite high (Graph 2). Maximum richness was observed with respect to families Oxyopidae, Salticidae, Araneidae and Lycosidae.

Human habitat was found in low diversity of spider species. In result which found from this research is that there are less spider diversity in the agricultural land cooperativity with the

forest. The chosen study of my research eyes upon four types of vegetations namely Potato, Cabbage, Beans.

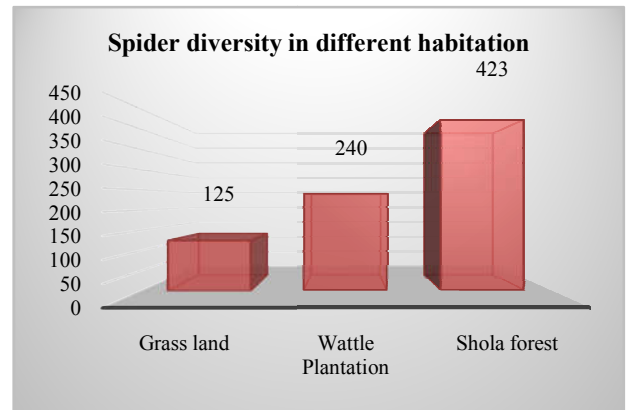


Fig 2 Spider diversity in different habitats in the Nilgiris

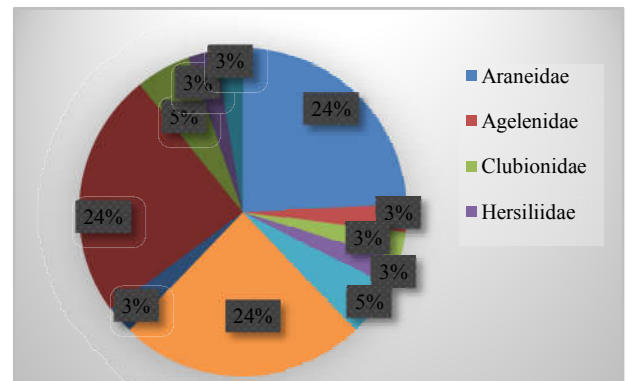


Fig 3 Percentile distribution of spider families

More spider's diversity could be found only in the peas than the other vegetation. Hence, peas have produce more flowers than Potato, Cabbage, and Beans. After using pesticides, the number of spider diversity gets declined. So, this research strongly recommends to reduce the usage of pesticides completely in such a way that spider's diversity could be naturally expanded more and more for the welfare of the agricultural lands.

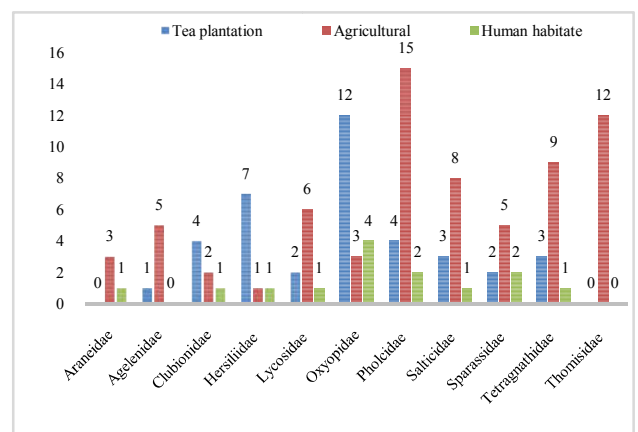


Fig 4 Spider diversity in different area of agricultural lands

Maximum species diversity and dominant family was Araneidae with 12 species. Out of 59 species in natural and agricultural lands. 23 Species were recorded only in Agricultural land, 10 species in Human habitat areas, 12 species in vegetation land. Remains in grass land areas. The present study showed significant variation in the population

density among the different habitats but not in the species richness and diversity.

**Table 2** Spider assemblages in different Agricultural field

Family	Potato	Beans	Peas	Cabbage
Araneidae	2	1	7	2
Agelenidae	0	2	0	1
Clubionidae	1	1	3	0
Hersiliidae	0	0	2	0
Lycosidae	0	1	0	0
Oxyopidae	2	0	3	1
Pholcidae	0	1	2	0
Salticidae	2	3	5	5
Sparassidae	1	3	4	0
Tetragnathidae	3	2	0	0
Thomisidae	3	2	3	1
<i>Total</i>	14	16	29	10

## Reference

- Tikader BK. Handbook of spiders (Anon, Ed) Zoological Survey of India, Calcutta, 1987, 251.
- Oyewole OA, Oyelade OJ. Diversity and distribution of spiders in Southwestern Nigeria. *Natural Resources*. 2014; 5(15):926-935.
- World Spider Catalog. Natural History Museum Bern, online at <http://wsc.nmbe.ch>, version 18.0, accessed on 13 July, 2017.
- Keswani S, Hadole P, Rajoria A. Checklist of Spiders (Arachnida: Araneae) from India-2012. *Indian Journal of Arachnology*. 2012; 1(1):129.
- Dharmaraj J, Gunasekaran C, Rajkumar V, Chinnaraj P. Diversity of spiders (Arachnida: Araneae) in Nilgiris, Tamil Nadu. *Int. J Adv. Res. Biol. Sci.* 2017; 4(5):143-147
- Vinay Malik and Vivek Goyal. Biodiversity of spiders in different habitats of Western Haryana, India. *Journal of Entomology and Zoology Studies* 2017; 5(4): 822-825
- Dharmaraj J, Gunasekaran C, Rajkumar V, Chinnaraj P. Diversity of spiders (Arachnida: Araneae) in Nilgiris, Tamil Nadu. *Int. J Adv. Res. Biol. Sci.* 2017; 4(5):143-147
- Pai IK, Spiders of Taleigao Plateau, Goa, India. *Journal of Environmental Science and Public Health*. 2017; 1 (4): 240-252 240
- Tikader BK. Handbook of spiders (Anon, Ed) Zoological Survey of India, Calcutta, 1987, 251.
- Tikader BK. Thomisidae (Crab-Spiders): Fauna of India (Araneae), Zoological Survey of India. Kolkata. 1980; 1:1-247.
- Tikader BK. Family Gnaphosidae: Fauna of India (Araneae), Zoological Survey of India, Kolkata. 1982b; 2:295-536.
- Tikader BK, Malhotra MS. Lycosidae (Wolf-spiders): Fauna of India (Araneae), Zoological Survey of India, Kolkata. 1980; 1:248-447.
- Barrion AT, Litsinger JA. Riceland Spiders of South and Southeast Asia. CAB International, Wallingford. 1995, 1- 736
- Jocque R, Dippenaar-Schoeman AS. Spider families of the world. Tervuren: Musée royal de l'Afriquecentral, 2006.
- Deshmukh US, Raut NM. Seasonal diversity and status of spiders (Arachnida: Araneae) in Salbardi forest (Satpura Range), Maharashtra, India. *Journal of Entomology and Zoology Studies*. 2014; 2:278-281.

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