

## Studies on Diversity of Spider Fauna in Ahmednagar District, Maharashtra State, India

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### ABSTRACT

The order Aranae of class Arachnida has a special value in the studies of ecology as it serves as a biological indicator. The main objective of the present study was to find out the diversity and characteristics of spiders from Ahmednagar district. The study on diversity of spider was conducted from various collection sites such as Kopargaon, Madhi Bk, Kumbhari (Godavari River area), Faria bag, Pimpalgaon Malvi, Dongargan, Mahatma Phule Krishi Vidyapeeth, Rahuri and Kolhar. The 108-specimen spiders were collected from various sites. The spider specimen collected were photographed, observed, identified and classified with the help of Zoological Survey of India, Pune. Out of 60 specimens identified, belong to 09 families and 18 genera.

Figures : 27

References : 34

Tables : 03

KEY WORDS : Biodiversity, Biological indicator, Ecology, Godavari River, Spider.

### Introduction

India has plenty of flora and fauna and has mega diversity in the world. The knowledge regarding the diversity, distribution and abundance of spider in India is scattered variably. Spiders are the most diverse group of organism. Spider acts as bio-control agent<sup>3</sup>. Spiders maintain and regulate the terrestrial arthropod population as they form important predators<sup>5,25</sup>. Spiders are ample in number and are ecologically important in almost all terrestrial habitats. There are about 37,000 identified spider species which is a small number of their total diversity<sup>1</sup>.

Spiders are found to be predators in several ecosystems. Spiders also form an important food source for bird, lizard, wasps and other animals<sup>13</sup>. Spider silk is important to some birds for preparation of their nests, Out of 42, 24 families of passerine birds and nearly all species of humming birds depend on spider's silk and caterpillars to build their nests<sup>11,27</sup>. Spiders are found in terrestrial ecosystem and also few species occur in freshwater and marine water habitats<sup>6</sup>.

To identify spiders on the basis of morphological features is very difficult task. Problems in arachnid identification are also due to moulting in many species which continue to grow as adults, leading into gross size differences, for example some *Nephilia* males are double the length of others<sup>4</sup>. By considering the importance of spiders in the natural reduction of many insect pests and as bioindicators, immediate efforts are essential to understand spider's diversity. The present knowledge of spiders of Western Ghat refers to the work<sup>2,8,9,12,14,15,23,24,28</sup> tried to collect data for documentation of diversity of spider's fauna in Western Ghat.

The 42 species of spiders were under 20 genera and 14 families at Sawanga-Vithoba Lake region, District Amaravati, State of Maharashtra, India<sup>34</sup>.

The present study was undertaken to investigate the diversity of spiders. We hope that the results obtained from this study will be helpful in updating faunal data of the Ahmednagar region and will inspire future research workers.

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## Material and Methods

**Study Area:** Study area of this work was District Ahmednagar which is located in Maharashtra state of India. (19.4555° N, 74.4057° E). The study on diversity of spider was conducted from various collection sites such as Kopargaon, Madhi BK, Kumbhari (Godavari River), Faria bag, Pimpalgaon Malvi, Dongargan, Mahatma Phule Krishi Vidyapeeth, Rahuri, Kolhar as shown in Table-1. The 108-Specimen spiders were collected from various sites during July 2018 to August 2018.

Collection site was surrounded by some urban area, hilly area and most agricultural fields. Spider specimens were collected from residential area, forest plantation, crops and agriculture fields from various localities of Ahmednagar district.

Following methods were used for the collection:

(1) Hand picking and (2) Sweep Netting using insect

collection Net. The specimens were preserved in 70% alcohol, labeled and sent to Z.S.I. (Zoological Survey of India) for identification by the Expert in Spider Taxonomy. Some species of spiders were observed and identified by using the reference books<sup>29,30,31</sup>. Before preservation, all specimens were photographed by MI Mobile Camera, Model No: Redmi 4.

Total 108 Spider specimens were collected from different localities in study area and identified with assistance of experts from Zoological Survey of India, Pune (Ref. File No. 6-1/Tech./ 2019-20/ 347, dated 01.04.2019) together with keys<sup>31</sup>.

## Results

The list of spider species is presented below (Table-2). Out of 60 specimens, 27 Species represent 09 families and 18 genera. The Araneidae is the most represented family with 12 species followed by Salticidae

**TABLE-1 : Locations of Selected Collection Sites for Survey of Spiders**

Locality/Collection Site	Geographical Location	Habitat type
1) Residential area (House), Kopargaon	N 19°53'35.1" E 074°17'26.4"	Collected from residential area
2) K. J. S. College Campus, Kopargaon	N 19°52'27.7" E 074°28'57.7"	Botanical garden
3) Madhi B.K., Kopargaon	N 19°54'15.4" E 074°24'51.0"	Agriculture field
4) Faria Bag, Ahmednagar	N 19°53'35.1" E 074°17'26.4"	Forest
5) Pimpalgaon Malvi, Ahmednagar	N 19°12'22.35096" E 74°45'39.25836"	Agriculture field
6) Dongargan, Ahmednagar	N 19°15'1.28556" E 74°44'28.8096"	Mountain rock
7) Godavari River, Kumbhari, Tal- Kopargaon	N 19°54'15.4" E 074°24'51.0"	River side- wet area
8) M.P. Krishi Vidyapeeth, Rahuri, Ahmednagar.	N 19°23'33.6372" E 74°38'55.7772"	Agriculture field
9) Kolhar, Tal- Rahata, Ahmednagar.	N 19.2045° E 74.8887°	Neem Tree

TABLE-2 List of Spider Species Reported from Present Study

Name of Family	Zoological Name
<b>Araneidae</b>	1. <i>Araneus</i> sp.
	2. <i>Argiope aemula</i>
	3. <i>Argiope anasuja</i>
	4. <i>Chorizopes</i> sp.
	5. <i>Cyclosa hexatuberculata</i>
	6. <i>Cyclosa moonduensis</i>
	7. <i>Cyrtophora cicatrosa</i>
	8. <i>Cyrtophora citricola</i>
	9. <i>Cyrtophora</i> sp.
	10. <i>Eriovixia excelsa</i>
	11. <i>Gibbaranea bituberculata</i>
	12. <i>Neoscona mukerjei</i>
<b>Salticidae</b>	13. <i>Marpissa</i> sp.
	14. <i>Plexippus paykulli</i>
	15. <i>Plexippus</i> sp.
	16. <i>Telamonia dimidiata</i>
<b>Oxyopidae</b>	17. <i>Oxyopes chittrae</i>
	18. <i>Oxyopes pankaji</i>
	19. <i>Peucetia viridana</i>
<b>Lycosidae</b>	20. <i>Hippasa madraspatana</i>
	21. <i>Hippasa olivacea</i>
	22. <i>Hippasa pisaurina</i>
<b>Pholcidae</b>	23. <i>Crossopriza lyoni</i>
<b>Thomisidae</b>	24. <i>Henriksenia hilaris</i>
<b>Tetragnathidae</b>	25. <i>Leucauge celebesiana</i>
<b>Eresidae</b>	26. <i>Stegodyphus sarasinorum</i>
<b>Hersilidae</b>	27. <i>Hersilia savignyi</i>

(04 species), Oxyopidae (03 species) and Lycosidae (03 species) and 01 species each from family Pholcidae, Thomisidae, Tetragnathidae, Eresidae and Hersilidae (Tables 2 & 3).

Family Araneidae is most dominant family with 12 species. This family accounts for 44% of total species recorded in the present study. Araneidae is followed by Salticidae (15% of total species), Lycosidae and Oxyopidae (each representing 11% of total species). Four

families (Tetragnathidae, Eresidae, Hersilidae and Pholcidae) are each represented only by 01 species accounting for 3.57% of total species each. The images of 27 Spider Specimens are as given below.

### Discussion

The results obtained show the dominance of spiders from family Araneidae (44% of the total species) followed by families Salticidae (15%), Oxyopidae and Lycosidae (11% each) and 03% of the species



**Figs :** 1. *Araneus* sp., 2. *Argiope aemula*, 3. *Argiope anasuja*, 4. *Chorizopes* sp., 5. *Cyclosa hexatuberculata*, 6. *Cyclosa moonduensis*



Figs. : 7. *Cyrtophora cicatrosa* 8. *Cyrtophora citricola*, 9. *Cyrtophora* sp. 10. *Eriovixia excelsa*, 11. *Gibbaranea bituberculata*, 12. *Neoscona mukerjei*



Figs. : 13. *Marpissa* sp., 14. *Plexippus paykulli*, 15. *Plexippus* sp., 16. *Telamonia dimidiata*, 17. *Oxyopes chitrae*, 18. *Oxyopes pankaji*



Figs. : 19. *Peuceitia viridana*, 20. *Hippasa madraspatana*, 21. *Hippasa olivacea*, 22. *Hippasa pisaurina*, 23. *Crossopriza lyoni*, 24. *Henriksenia hilaris*



25



26



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Figs. : 25. *Leucauge celebesiana*,  
26. *Stegodyphus sarasinorum*,  
27. *Hersilia savignyi*

TABLE- 3: Family Wise Number of Species

Sr. No.	Family	Species
1	Araneidae	12
2	Pholcidae	1
3	Lycosidae	3
4	Hersilidae	1
5	Oxyopidae	3
6	Thomisidae	1
7	Salticidae	4
8	Tetragnathidae	1
9	Eresidae	1

representation each from Pholcidae, Thomisidae, Tetragnathidae, Eresidae and Hersilidae. The results show that the ground-dwelling Spider families such as Salticidae and Lycosidae are quite common in the study area. Out of 252 genera of spiders from India<sup>26</sup>, 18 genera were recorded in the present study. Total 21 species mainly of hunting and web-making spiders in 19 genera of 13 families were reported from Karhandla<sup>7</sup>. Out of 60 families represented from Indian region<sup>14, 15</sup>, 09 families were represented from Ahmednagar region. This means that 15% of the families were represented in the study. The high diversity of spiders in Ahmednagar can be attributed to high diversity of spider habitats (plants, farm areas, agricultural fields) in the area. Our results are quite similar to those obtained earlier<sup>33</sup>, wherein recorded 32 spider species from Pune area. The results obtained are in conformity with the earlier studies<sup>2,10,16,17,20,21,32</sup>.

### Conclusion

The present study is a result of preliminary survey of spider fauna. However, further studies are essential to explore spider diversity and to find out more species of spiders from the Ahmednagar district.



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