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Diversity and Status of Spiders (Arachnida: Araneae) in Ballarpur Forest, District Chandrapur, Maharashtra, India

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Abstract

Spiders are the most unique and functionally significant predators maintaining the terrestrial arthropod population, which makes them efficient biological control agents in the environment. Tropical dry deciduous forests encircle the majority of the Ballarpur forest. The impact of the variety pattern of spider species is evident in the hot, dry summer months, which also see a lot of rainfall and a humid atmosphere. Research on the species composition and distribution patterns in the study area is desperately needed. The research work is carried out for 12 months. A survey of sampling sites for the collection of Spider species was done from January 2024 to December 2024. Study was conducted in the Ballarpur forest. Spiders from 32 genera and 14 families were identified during the investigation. The most prevalent family in the Ballarpur region was found to be Araneidae and Salticidae, Pholcidae, and Lycocidae. The population density in the various habitats varied significantly in the current study, although not concerning species diversity and richness

Keywords: *Species richness, diversity, Ballarpur forest, Araneidae, Distribution pattern.*

Introduction

Occurrence and Habitat of spider assessment in India are as compared to other regions of the world. The study Indian spider was done by mostly European Archeologists and then by Indian Archeologists reported by, [1] Indian Archeology by working on spiders for about four decades [2].

India is noted as anincredibly varied nationfor its hugevariety of living organisms and providing a biodiversity of the Araneae order which includes spiders. In terrestrial spiders are diverse groups and are categories about habitat use by spiders. Spiders are a biological indicator determine about ecosystem. They can easily respond to Anthropogenic and Natural disturbances. They are work as a bio-indicator and maintain ecological balance. In India about 16, 86 species of spiders identified out of world species of 44,906. They mostly depend on the small insects as a food [3]. Spiders are predators they arevery quiet economic influential to humans because of they have great ability to reduce pest species in agriculture.Spiders are functionally significant predator to maintain terrestrial arthropod population, so it effective biological control species in ecosystem.Spider body divided in to two parts, cephalothorax and abdomen. Cephalothorax has 4 pairs of legs and abdomen without legs[4][5].

Reported 36 genera belongs to 11 families[3], Spiders are an essential but least research workon arthropod that significant role in maintain of other invertebrate population in most of ecosystem [6].

Material and Methods

Study area

The present investigation was carried out fromJanuary 2024 to December 2024 in and around Ballarpur forest. Ballarpur Located in Chandrapur District. It is located in the far east of MS. It is part of the Nagpur division. The district is in the eastern part of the Vidarbha region. It is located between 19.30' N and 20.45' N latitude and at 78.46' E longitude. In the Survey of India degree sheet, it falls in NOS 55 LF and 56 I M. Most of the Ballarpur region surrounded forest; it is a tropical dry deciduous forest. Road side forest densely populate by *arthenium spp., Lantana camara, Ageratum spp., Argemonemexicana, Alternanthera spp., Balanites spp*. are spreading at faster rate causing delimiting the spread of parental species like *Cassiataraspp, Ageratum spp*. and other herbs specie. *Cassia tora* and other local wild species seem to be dominating on *arthenium spp.*

Sampling site and Sample collection: The field surveys on spider were carried out in study area three times in a week for

period of January 2024 to December 2024. Spiders will be access in study area from 9.00 am to 11.00 am in the morning by random observations during walking through three selected sites based on habitats present.Spiders were photographed, separated and fixed 70% alcohol. Spider species were identified using standard identification keys of [7],[8]&[2].

Sampling site: The Study area is almost surrounded by dense forest with varieties of plants, Fallowing survey sites was selected.

1) Sampling site I- Road side populated plantation.
2) Sampling site II -Moderate populated plantation,
3) Sampling site III-Maximum (Dense) populated plantation.

Data analysis: Spider diversity was analyzed by using indices

Shannon –Wiener index (H)= ∑Pi (InPi)

Where H =Shannon –Wiener index, Pi Proportion of individuals belongs to the ith each species

1) **Simpson index (D)** = ∑ ni (ni − 1)/N (N − 1)
   Where ni= No. of Individual of a species, N = Total No. of All individuals

2) **Evenness index (E)** = H/ln(S)
   Where H= Shannon – Wiener Index, ln(S) = Natural logarithm of species richness

Result and Discussion

The total number of spider species observed and identified were 45, which comprises of 45 species and 32 genera at Ballarpur forest area, which belongs to 14 families of Order Araneae represent in the table no. 1.1.Fig.1.2maximum diversity was observed at site III (Maximum (dense) populated plantation) 403 species was observed during site visit.Moderate species diversity was observed at site II (Moderate populated plantation) 276 species was observed during site visit. Minimum at site III (Road side populated plantation) 206 species was observed during site visit. Similar study was done by[9]Identified 32 species of spider among with 7 families in different habitat of Pune University. Observed and identified 785 species under 247 genera belonging to 44 families in 36 districts of Maharashtra[10].

The family Araneidae had maximum species in the total investigation are with 5 genera and 13 species. It is followed by family Salticidae with 7 genera and 7 species. It is followedwith the Pholcidaefamily which includes 4 genera and 4 species. Family Lycosidae with 3 genera and 4 species, family Oxyopidae with 2 genera and 5 species, Philodromidae with 3 genera and 3 species and family Theridiidae, Dictynidae, Desidae, Sparassidae, Thomisidae, Agelenidae and Scytodidae showed least diversity with 1 genera and 1 species. Similar work was made by[11]reported 21 families and Arachnidae was dominant with 34 genera, family Salticidae represented by 8 genus and 9 sp., offamily Lycosidae 5 genera and 8 species at area of Chandrapur.

Spider diversity indices represent in table no. 1.1 and 1.2. Fig.1.2inthe Ballarpur forest region Evenness diversity index of total species was 0.632, Shannon diversity index was 2.233 and Simpson values 0.837. At site I the maximum of species was 206, Simpson (D) was 0.025, Shannon (H) was 1.194 and Evenness was 0.824. At site II the Abundance of species was 276, Simpson (D) was 0.023, Shannon (H) was 2.37, and Evenness was 1.227, and at site III the Abundance of species was 403, Simpson (D) was 0.023, Shannon (H) was 2.063 and Evenness was 0.953. Similar study was reported by [12] and stated that the seasonal diversity and status of spiders in Sarbardi forest, Satpuda range, Maharashtra, India.

Table No. 1.1: Diversity index of Spider species at Ballarpur forest region

Diversity Index					H'	D	E
Sr. No.	Family	Order	Total genera	Total species	Shannon	Simpsons	Evenness
1	Araneidae	Araneae	5	13	0.359	0.079	0.140
2	Salticidae	Araneae	7	7	0.289	0.021	0.076
3	Pholcidae	Araneae	4	4	0.215	0.006	0.057
4	Nephilidae	Araneae	1	2	0.138	0.001	0.036
5	Lycosidae	Araneae	3	4	0.215	0.006	0.057
6	Oxyopidae	Araneae	2	5	0.244	0.010	0.064
7	Philodromidae	Araneae	3	3	0.181	0.003	0.047
8	Theridiidae	Araneae	1	1	0.085	0.000	0.022
9	Dictynidae	Araneae	1	1	0.085	0.000	0.022
10	Desidae	Araneae	1	1	0.085	0.000	0.022
11	Sparaassidae	Araneae	1	1	0.085	0.000	0.022
12	Thomisidae	Araneae	1	1	0.085	0.000	0.022
13	Agelenidae	Araneae	1	1	0.085	0.000	0.022
14	Scytodidae	Opiliones	1	1	0.085	0.000	0.022
Total Species				45	2.2337	0.8737	0.6324

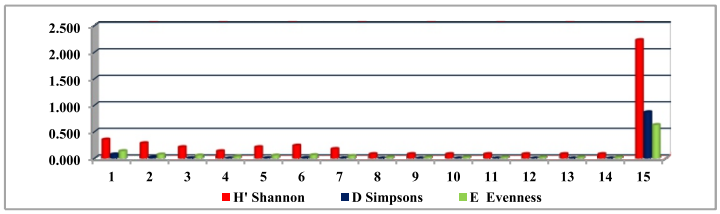

Fig 1.1: Family wise diversity index of Spider species

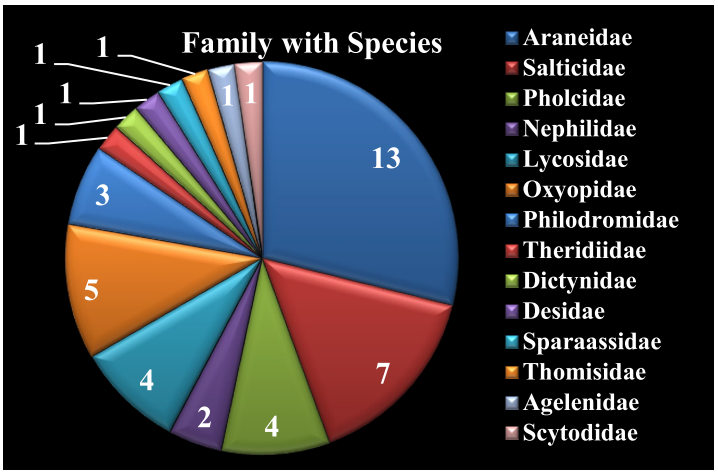

Fig 1.2: Distribution of Family wise species

Table No. 1.2: Diversity index of Spider species at three sites of Ballarpur forest region

Index	Site I	Site II	Site III
Abundance	206	276	403
Simpson (D)	0.025	0.023	0.023
Shannon (H)	1.194	2.370	2.063
Evenness	0.824	1.227	0.953

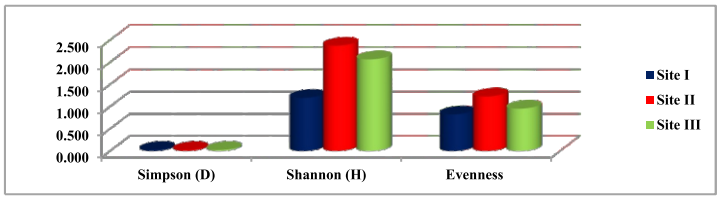

Fig No. 1.2: Diversity index of Spider species at three sites of Ballarpur forest region

Conclusion

Study was done at theBallarpur forest region to check spider diversity and also provide the baseline data for future studies. The survey was conducted for the 12 months. Study concluded that Ballarpur forest region showed maximum species diversity and richness, the maximum diversity was found at untouched area of site III. There is need to study seasonal variation of spider species in this region and need to follow conservation normsfor the betterment of the ecosystem.

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References

1. Keswani, S., Hadole P. andRajoria A. (2012). Checklist of Spiders (Arachnida: Araneae) from India-2012. Indian journal of Arachnology, Vol.01, Issue 01. 129.
2. Tikader, B.K. (1987). Handbook of Indian Spiders, Zoological Survey of India. Calcutta, India, 251.
3. Dharmaraja, A. T. (2017). Role of reactive oxygen species (ROS) in therapeutics and drug resistance in cancer and bacteria. Journal of Medicinal Chemistry,Vol.60, Issue 08 , 221-3240.
4. Sebastian, P. A., and Peter K. V. (2017).Spiders of India. Universities Press (India) Private
5. Platnick, N. I. (2008).The world spider catalog, version 8.5. http://research. amnh. org/entomology/spiders/catalog/index. html.
6. Wankhede, K. P., Kamdi N. Y., Parchand M. P., Anjankar V. P., andBardale R. V. (2012).Estimation of stature from maxillo-facial anthropometry in a central Indian population. Journal of forensic dental sciences, Vol.04, Issue 01,34-37.
7. Davies, V.and Todd Zabka M. (1989).Illustrated keys to the genera of jumping spiders (Araneae: Salticidae) in Australia. MemQdMus; Vol.27, Issue 02,189-266.
8. Gajbe, P. (2003).Checklists of Spiders (Arachnid; Araneae) of Madhya Pradesh and Chhattisgarh. Zoos Print Journal; Vol.18, Issue 10, 1223-1226.
9. Wankhade, P. K., Sapkal R. S., andSapkal V. S. (2012).Drying characteristics of okra slices using different drying methods by comparative evaluation. In Proceedings of the world congress on engineering and computer science Vol.2, 24-26.
10. Singh, R. (2022).An updated checklist of spider (Arachnida :Araneae) Fauna of Maharashtra State, India IJBS Vol.13, Issue 01, 14-74.
11. Sawane, A. P. (2022). Community composition and diversity of spider assemblages in relation to dry deciduous forest of Chandrapur district, India. Asian Journal of Conservation Biology, Vol.11, Issue 02, 289-296.
12. Deshmukh, U. S. andRaut N. M. (2014). Seasonal diversity and statusof spiders (Arachnida: Araneae) in Salbardi forest (Satpura Range), Maharashtra, India. Journal of Entomology and Zoology Studies, Vol.02, Issue 06, 278-281.