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Distribution and Diversity of Family Araneidae of Spider species in Ballarpur region, District Chandrapur, M.S. India

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Abstract

Araneids, the common orb-weaving spiders, are found all over the world. They typically prefer damp environments and are rarely seen in drier ones. Most species create orb-webs among leaves. These webs may be high in trees or in shrubs, grass, or herbs, even though the spiders are not ground-dwellers. The majority of the Ballarpur area is encircled by forest, characterized as a tropical dry deciduous forest which shows the arid and moist environment.This illustrates the impact of the diversity pattern observed in Spider species. There exists an urgent requirement for research focused on species composition and distribution patterns within the study area.The research project is conducted over a period of 12 months.A survey was conducted at various sampling sites for the purpose of collecting Spider species from February 2024 to February 2025. Survey represents Araneidae is an abundant family. Neoscona and Cyclosa show the maximum species diversity.The current study revealed considerable variation in population density across different habitats.

Keywords: *Ballarpur, Araneidae, Deciduous, Neoscona and Cyclosa.*

Introduction

Spiders are found almost everywhere, with the exception of certain niches like the Arctic and Antarctica. Nearly every type of plant hosts its own spider fauna, as do dead leaves on the forest floor and trees during winter. They can be located in various places, including under bark, beneath stones, below fallen logs, among foliage, in houses, on grass leaves, and in underground burrows, among others[1]. Their success is evident in the approximately 45,700 recorded spider species and 114 families on our planet this remarkable level of diversity can be attributed to their superior adaptive capabilities, in addition to their distinct morphological and behavioural traits[2]. Spiders have a pair of neurotoxin glands in their cephalothoraxes, which can be utilized for medicinal purposes and as non-polluting pesticides. They are commonly referred to as wandering spiders, ambushing spiders, web-building spiders, and other names, depending on their characteristics. Similar to many biological species, spiders face significant threats to their survival due to deforestation, habitat loss from intensive agriculture, and human settlement.

Spiders belong to the class Arachnida, have only two body parts: the abdomen and cephalothorax. The abdomen is smooth and not segmented, although the Spiders possess eight legs, which are located in the hard cephalothorax. Spiders (Arachnida: Araneae) are among the most despised chelicerate arthropods by humans, despite being aware that they are vital in reducing the prevalence of insect pests in agriculture, as they consume a large number of insect pests. In terms of animal diversity globally, the order Araneae ranks seventh, behind the top five insect orders.

The spiders use elegance and precise geometry in weaving their orb-webs. Their finished creations are unparalleled in craftsmanship. Many of them create nest-like hiding places by folding a leaf or cluster of leaves. This shelter is somewhat removed from the web, yet instantly connected to the web center by threads.In comparison to females,male araneids are typically much smaller and less visible on the web. Spiders are divided into several categories, including web spiders, wolf spiders, jumping spiders, and spiders that devour birds. A few species possess a variety of hues. Spiders do much more than only defend themselves.

To deceive their predators, certain species can be discovered in leaves, barks, twigs, and other materials. There is no need to emphasize the vital role of insects in ecology. Although they are solely predators, spiders play a significant role to maintain ecological balance and pest species[3].They can survive and continue to reproduce normally during periods where there is a shortage of prey because of their exceptionally high resilience to famine. Spiders are among the most prevalent terrestrial creatures and are an important part of many ecosystems' predatory arthropods. The majority of terrestrial ecosystems are known to be inhabited by spiders. They can combat a wider variety of insect pests since they are generalist predators[4].Spiders can be found in a variety of wetlands and marshes and can survive in both tropical and temperate settings. They live in many different biomes, such as Located in the Southern Swamp, near the Deku palace, are tundra, chaparral, desert, mountains, woods, and rainforests [5].Some notable contributions in spider diversity reportedby [6],[7],[8]and [9],till to date, no checklist of spider fauna of Ballarpur region district, Chandrapur. The objective of this study was to identify spider diversity of this region.

Materials and Methods

Study area

The Chandrapurdistrict is located between 19.30' N and 20.45' N latitude and at 78.46' E longitude.The majority of the Ballarpur area is encircled by forest.Present study was carried out for the period of one year, from February 2024 to February 2025. In various carefully chosen sampling plots, well-established,Fallowing sampling procedures for spider collection were used, including litter sampling, vegetation beating, hand picking, and sweep netting. Collection, identification and photography of spider species were done by standard literature.

Result and Discussion

The present study was focus on Family Araneidae of spider species in Ballarpur region, District Chandrapur. The Araneidae family ranks as the third most diverse group of spiders worldwide, following Salticidae and Linyphiidae. It encompasses the largest spider genus, Araneus, which is likely polyphyletic and comprises 641 species. In terms of genera, Araneidae is the third largest, containing 175 genera[10].

In present investigation,a total 34 species were identified belongs 07 genera's of Family Araneidae among the order Aranae represent in table no. 1.1 and Fig 1.1.Diversity in study area represents total 07 genera, which include,Neoscona, Cyclosa, Araneus, Argiope, Cyrtophora, Arachnura and Zygiella. Among these, Neoscona represent 10 species, Cyclosa 10 species, Araneus 06 species, Argiope and Cyrtophora 03 species and Arachmura and Zygiella both are recorded 01 species.Neoscona and Cyclosa species were found the maximumduring investigation.

Similarly reported by,[11]reveals the occurrence of 12 species of spiders belonging to 7 families.Represented by 4 species followed by Araneidae family consist of 3 species and Sparassidae, Clubionidae, Linyphiidae, Pholcidae, Lycosidae family represented by single species each.[12]Observed the total of 63 species of belongs to 52 genera and under the 14 families. A similar study was on the biodiversity of spider species within the flora and fauna of the Western Ghats and the Eastern Himalayas in Tumakuru, Karnataka India [13]. They identified a total of 172 spiders, which were categorized into 14 species across 6 families. Themost of species belongs toSalticidae and Araneidaerepresented 33% and 27% of spider fauna at diversityof spiders in the cashew ecosystem in Kerala, India,and reported 60 spider species across 25 families and 42 genera identified from various habitats within the examined region [14].The studyreveals that the of spiders are affected by habitat structure and vegetation parameters, changes to the habitat due to human activities can destruct ecological structure and may even result in the local extinction of certain species. Similar study reported by [15]noted that with the rise in deforestation and settlement, there is a corresponding loss of the natural habitat for spiders.

Table No. 1.1: Diversity of Spider species at Ballarpur region, District Chandrapur

Sr. No.	Family	Genus	Species
1	Araneidae	Neoscona	nautica
2			nautoca
3			adianta
4			oaxacensis
5			bengalensis
6			mukherji
7			pavida
8			rumpfi
9			sinhagadensis
10			theis
11		Cyclosa	bifida
12			hexatuberculata
13			spirifera
14			confraga
15			oculata
16			insulana
17			moondiuensis
18			mulmeinensis
19			neilensis
20			spirifera
21		Araneus	ellipticus
22			mitifica
23			diadematus
24			ventrisus
25			agulatus
26			viridisomus
27			aemula
28			anasuja
29			aurantia
30		Cyrtophora	citricola
31			cicatrosa
32			moluccensis
33		Arachnura	angura
34		Zygiella	indica

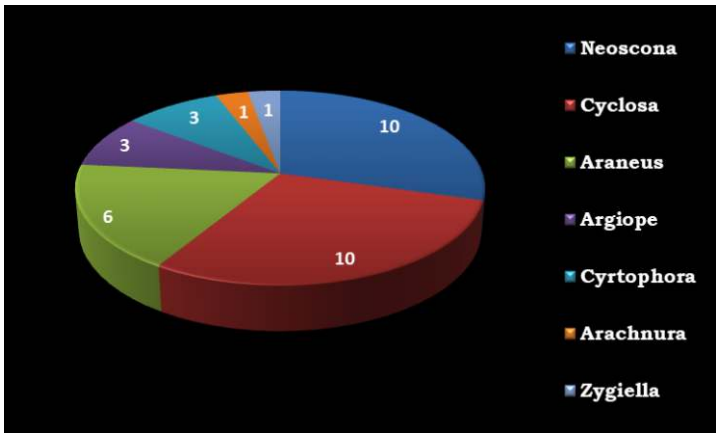

Fig 1.1: Genus wise Spider diversity at Ballarpur region District Chandrapur

Conclusion

A study was conducted in the Ballarpur forest region to assess abundant spider family diversity and to establish baseline data for future research. The survey spanned duration of 12 months. The findings indicated that the Ballarpur forest region exhibited theAraneidae is abundant family and Neoscona and Cyclosa genera shows maximum species. It is essential to investigate the seasonal variations of spider species in this area and to adhere to conservation guidelines to enhance the ecosystem.

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