

Assessment of Diversity Distribution of Spider Species of Saoli Region of Chandrapur District, Maharashtra, India

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Abstract

Present study was carried out to explore the diversity and abundance of spiders from Saoli region, Dist. Chandrapur, Maharashtra, India. The sites were systematically searched for spiders. Each site was surveyed for one year from February 2025 to January 2026. In the present investigation, a total of 483 individual spiders were documented, representing 58 species belonging to 36 genera and 15 families. The most diverse family observed was Araneidae, which had the highest species richness with 15 species (25.86%), followed by Salticidae with 11 species (18.97%), Lycosidae with 7 species (12.07%), Thomisidae with 6 species (10.34%), and Oxyopidae with 4 species (6.90%). Least presence was recorded from the families Pholcidae, Gnaphosidae, Uloboridae, Scytodidae, Philodromidae, and Eresidae, each represented by a single species (1.72%). Saoli region shows abundant forest area which is suitable as spider habitat.

Keywords: Diversity, Spiders, Taxonomy, Araneidae, Saoli Region.

Introduction

Spiders are prevalent predatory organisms within the animal kingdom [1]. They serve as abundant predators across numerous terrestrial ecosystems, with population estimates nearing one million individuals per hectare in natural settings [2]. Primarily, they are entomophagous, although a limited number engage in arachnophagy [3]. Various spider families include species that can capture vertebrate prey, categorized as "habitual vertebrate-eaters" and "occasional vertebrate-eaters"; some larger spider species may sometimes consume small mammals, birds, and lizards [4]. Spiders fulfil a crucial ecological function as exclusive predators, effectively regulating insect populations [3]. As ectothermic organisms, their food intake, feeding behaviours, metabolic rates, and activity levels are influenced by temperature [5].

Spiders rank among the most diverse and ecologically important predators, significantly contributing to the regulation of terrestrial arthropod populations. This characteristic renders them effective biological control agents within various ecosystems [1]. Classified under the order Araneae, spiders constitute one of the largest groups of predatory organisms in the animal kingdom [6]. They play an essential role in the lower food web, helping to maintain ecological equilibrium and acting as reliable bioindicators of natural ecosystems [7]. Due to their insectivorous diet and diverse foraging strategies, spiders are vital for stabilizing insect populations. The objective of the aforementioned study is to identify and assess spider diversity in and around the Saoli Region, Dist. Chandrapur.

The exploration of spider diversity boasts a substantial historical background, commencing with the early taxonomic documentation by [8]. Following this, [9] produced illustrated keys pertaining to Australian jumping spiders. The World Spider Catalog [10] enumerates 52,187 spider species distributed among 4,390 genera and 134 families worldwide, underscoring the extensive range of these predatory creatures. In contrast, research on spider diversity and distribution in India is relatively scarce when compared to other global regions. The initial investigations were predominantly carried out by European arachnologists, with subsequent advancements made by Indian scholars. Within India, 1,686 spider species across 438 genera and 60 families were recorded [11]. A significant milestone in Indian arachnology was achieved by Benoy Krishna Tikader, who devoted nearly forty years to the study of spiders. His influential publication catalogues 1,066 species across 40 families, marking a substantial progression in the discipline [12].

In Maharashtra, the foundational work of Tikader during the 1980s established a basis for the comprehension of spider diversity. A detailed account of the spider fauna within the Tadoba Andhari Tiger Reserve located in Chandrapur was provided by [13]. Subsequent contributions by [14 & 15] have further enriched this body of knowledge by documenting spider species from various locales, including Nagpur, Buldhana, Amravati, and Vidarbha. Nonetheless, there remains a significant gap in biodiversity studies concerning spiders in the Chandrapur district, highlighting the need for comprehensive surveys.

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A six-month survey to assess the seasonal diversity of spider fauna in the Nagpur district of Maharashtra by [16]. Additionally, [17] explored the spider fauna in Sayagata Jungle and the Pandit Dindayal Upadhyay Eco Park situated in Bramhapuri, Maharashtra. Spider diversity in and around Lohara village, also within the Chandrapur district of Maharashtra was examined by [18]. Furthermore, [19] investigated spider diversity in the Mangalwedha region of Solapur district, Maharashtra. 25 spider species across 20 genera and 9 families were documented in the Rajnandgaon Block of Chhattisgarh, identifying habitat diversity and the family Salticidae as significant factors influencing distribution [20].

Study Area

Chandrapur district is located in the easternmost part of Maharashtra and is a component of the Nagpur division. It is geographically positioned in the eastern Vidarbha zone, spanning latitudes from 19.30°N to 20.45°N and longitudes from 78.46°E. As per the Survey of India, it is categorized under degree sheets numbered 55 LF and 56 IM. The Saoli Tehsil area, primarily characterized by tropical dry deciduous forests, experiences a climate that is predominantly hot and arid, with the exception of the monsoon season when humidity increases significantly due to considerable rainfall. During summer, temperatures frequently surpass 45°C, whereas in winter, they can plummet to as low as 10°C.

Research Methodology

Spider population surveys were carried out three times a week over a one-year period, commencing in February 2025 and concluding in January 2026. Observations were conducted between 9:00 am and 11:00 am through random sampling while traversing four habitat-specific locations within the study area. This area is predominantly encircled by dense forest, which hosts a variety of plant species, and four distinct sites were selected for the study. At the various meticulously chosen sampling locations, several spider collection methods were employed, including litter sampling, vegetation beating, hand picking, and sweep netting. The processes of collection, identification, and photography adhered to standard protocols and referenced literature, including works by [21, 12, & 10].

Results and Discussion

The one-year survey conducted from February 2025 to January 2026 across four sampling sites in the Saoli region yielded results that are detailed in Tables 1.1 and 1.2, Fig. 1.1, and Photoplate 1.1. This investigation recorded a total of 483 individual spiders, encompassing 58 species distributed across 36 genera and 15 families. A similar study by [18] examined spider diversity in and around Lohara village, located in the Chandrapur district of Maharashtra, where they identified 21 spider species belonging to 16 genera and 10 families. Additionally, [22] provided an updated checklist of spider diversity in Madhya Pradesh, documenting 336 species across 136 genera and 30 families from 36 of the state's 52 districts. The dominant families in their findings included Araneidae and Thomisidae, each comprising 55 species.

In the present investigation, the taxonomic composition revealed that the Family Araneidae exhibited the highest species richness, comprising 15 species (25.86%). This was followed by Salticidae with 11 species (18.97%), Lycosidae with 7 species (12.07%), Thomisidae with 6 species (10.34%), and Oxyopidae with 4 species (6.90%).

The remaining 10 families collectively accounted for 15 species (25.86%). At the genus level, *Neoscona spp.* (Araneidae) demonstrated the greatest diversity with 5 species, succeeded by *Cyclosa spp.* (Araneidae) and *Oxyopes spp.* (Oxyopidae), each with 3 species. Comparable results were documented by [16], who undertook a six-month survey on the seasonal diversity of spider fauna in the Nagpur district of Maharashtra, identifying 17 species across 10 families. Salticidae was identified as the most dominant family (23%), followed by Lycosidae (18%) and Gnaphosidae (17%). Additionally, a preliminary survey in the Ahmednagar District, reporting the identification of 60 specimens, which represented 27 species across 9 families and 18 genera was conducted [23]. Araneidae emerged as the dominant family, constituting 44% of the total species, followed by Salticidae (15%), and both Lycosidae and Oxyopidae (11% each).

Table 1.1: Taxonomic inventory of spider species recorded in Saoli region

FAMILY	GENUS	SPECIES	COMMON NAME
Araneidae	Neoscona	<i>N. nautica</i>	Yellow Spotted Orb-weaver
		<i>N. theisi</i>	Brown Orb-weaver
		<i>N. mukerjei</i>	Mukerji's Orb-weaver
		<i>N. bengalensis</i>	Bengal Orb-weaver
		<i>N. molemensis</i>	Mole Orb-weaver
	Cyclosa	<i>C. insulana</i>	Silver Orb-weaver
		<i>C. confraga</i>	Trash-line Orb-weaver
		<i>C. mulmeinensis</i>	Multiple-choice Orb-weaver
	Argiope	<i>A. anasuja</i>	Signature Spider
		<i>A. pulchella</i>	Band-legged Argiope
		<i>A. catenulata</i>	Grass Cross Spider
	Cyrtophora	<i>C. citricola</i>	Tent-web Spider
		<i>C. moluccensis</i>	Dome-web Spider
	Araneus	<i>A. mitificus</i>	Colorful St. Andrew's Cross Spider
	Nephila	<i>N. pilipes</i>	Giant Wood Spider
Salticidae	Plexippus	<i>P. paykulli</i>	Pantropical Jumping Spider
		<i>P. petersi</i>	Peters' Jumping Spider
	Menemerus	<i>M. bivittatus</i>	Gray Wall Jumper
		<i>M. nigli</i>	Nigli's Wall Jumper
	Hyllus	<i>H. semicupreus</i>	Two-striped Jumping Spider
	Telamonia	<i>T. dimidiata</i>	Red Jumping Spider
	Carrhotus	<i>C. viduus</i>	Widow Jumping Spider
	Myrmarachne	<i>M. plataleoides</i>	Ant-mimicking Jumping Spider
		<i>M. himalayensis</i>	Himalayan Ant-jumper
	Hasarius	<i>H. adansonii</i>	Adanson's House Jumper
Phintella	<i>P. vittata</i>	Banded Jumping Spider	
Lycosidae	Hippasa	<i>H. pisaurina</i>	Funnel Wolf Spider
		<i>H. agelenoides</i>	Funnel-web Wolf Spider
	Lycosa	<i>L. tista</i>	Garden Wolf Spider
		<i>L. madani</i>	Madan's Wolf Spider
	Pardosa	<i>P. sumatrana</i>	Grass Wolf Spider
		<i>P. birmanica</i>	Burmese Wolf Spider
	Arctosa	<i>A. indica</i>	Sand Wolf Spider
	Thomisidae	Thomisus	<i>T. spectabilis</i>
<i>T. projectus</i>			Flower Crab Spider
Runcinia		<i>R. affinis</i>	Grass Crab Spider
Ozyptila		<i>O. chandosiensis</i>	Ground Crab Spider
Camaricus		<i>C. formosus</i>	Beautiful Cross Spider
	<i>C. khandalaensis</i>	Khandala Crab Spider	
Oxyopidae	Oxyopes	<i>O. javanus</i>	Striped Lynx Spider
		<i>O. sunandae</i>	Sunanda's Lynx Spider
		<i>O. shweta</i>	Shweta's Lynx Spider
	Peucetia	<i>P. viridana</i>	Green Lynx Spider
Tetra-gnathidae	Tetragnatha	<i>T. javana</i>	Long-jawed Orb-weaver
		<i>T. maxillosa</i>	Long-jawed Spider
	Leucauge	<i>L. decorata</i>	Decorative Silver Spider
Sparassidae	Heteropoda	<i>H. venatoria</i>	Giant Crab Spider
		<i>H. fabrei</i>	Forest Huntsman
Hersiliidae	Hersilia	<i>H. savignyi</i>	Two-tailed Spider
		<i>H. tibialis</i>	Tree Trunk Spider
Pholcidae	Crossopriza	<i>C. lyoni</i>	Tailed Cellar Spider
Gnaphosidae	Zelotes	<i>Z. sataraensis</i>	Ground Sac Spider
Uloboridae	Uloborus	<i>U. plumipes</i>	Feather-legged Spider
Theridiidae	Theridion	<i>T. manjithar</i>	Cobweb Spider
	Steatoda	<i>S. grossa</i>	Cupboard Spider
Scytodidae	Scytodes	<i>S. fusca</i>	Spitting Spider
Philodromidae	Philodromus	<i>P. chamisis</i>	Running Crab Spider
Eresidae	Stegodyphus	<i>S. sarasinorum</i>	Social Velvet Spider

Table 1.2: Family-wise distribution of spider species in Saoli region Dist. Chandrapur

Family	Genera	Species	Percentage
Araneidae	6	15	25.86%
Salticidae	8	11	18.97%
Lycosidae	4	7	12.07%
Thomisidae	4	6	10.34%
Oxyopidae	2	4	6.90%
Tetragnathidae	2	3	5.17%
Sparassidae	1	2	3.45%
Hersiliidae	1	2	3.45%
Theridiidae	2	2	3.45%
Pholcidae	1	1	1.72%
Gnaphosidae	1	1	1.72%
Uloboridae	1	1	1.72%
Scytodidae	1	1	1.72%
Philodromidae	1	1	1.72%
Eresidae	1	1	1.72%
Total	36	58	100.00%

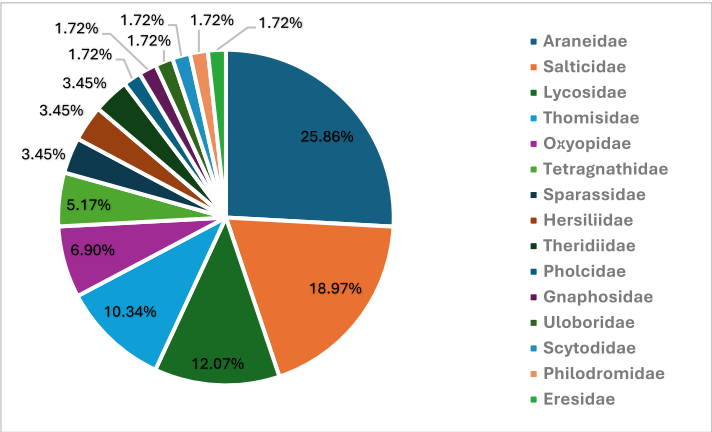


Fig. 1.1: Representing percentage of different families recorded during the study

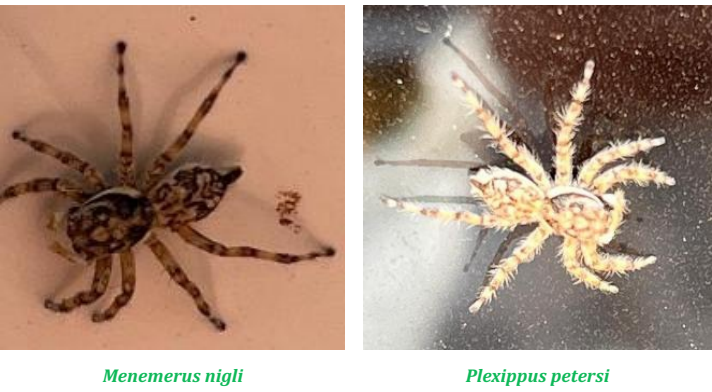
Conclusion and Recommendations

This research provides a significant contribution to the comprehension of spider diversity in the Saoli region of Chandrapur district, particularly within the lesser-explored Chandrapur district of Maharashtra. The results indicate that the Saoli area exhibits a rich diversity of spiders and establishes foundational data for future studies. It is crucial to explore the seasonal variations in spider diversity.

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Photoplate 1.1. Photographic plate showing representative spider species recorded during the study.



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