

Assortment of Spiders in the Agricultural Fields from District Wardha. (Maharashtra State)

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Abstract—Spiders are insectivorous predators on earth. Spiders are eight eyes and eight legs small creature. Spiders, are the most common ubiquitous animals on land, constitute an essential portion of the predatory arthropods in several ecosystems. Spiders play an important role in insect pest control without any harm to ecosystem. Regularly use of pesticides in agricultural fields which decreases the spider populations. Spiders are among the most abundant insectivorous predators of Terrestrial ecosystem.

Spider species abundance in agro-ecosystem can be high as undisturbed natural ecosystem. A survey of Spiders was carried out in Wardha District during October 2024 – October 2025. This article presents a study on the Diversity, distribution and current status of spider families in Wardha District. During the present study I have reported 139 species of Spiders belonging to 14 Families and 43 genera. Spiders of Families Araneidae, Clubionidae, Eresidae, Gnaphosidae, Lycosidae, Oecobiidae, Oxyopidae, Pholcidae, Salticidae, Sparassidae, Tetragnathidae, Theridiidae, Thomisidae and Uloboridae were recorded during the investigation. Such surveys are vital for conservation of these creatures in the light of climate change and building a biodiversity base line data of spider fauna of Vidarbha in near future. It is updated checklist of different agro-ecosystems from Wardha District.

Index Terms—Spiders, Diversity, Wardha, Maharashtra State.

I. INTRODUCTION

Spiders belong to order Araneae, class Arachnida and are members of phylum Arthropoda, the largest assemblage of animal with jointed legs and hard exoskeleton. They are the largest group of arachnids comprising more than 37,045 species distributed over 61 families over worldwide. They have unique habitat and they live in almost all the environments. They are

the most abundant predator of insects of terrestrial ecosystem and consume large number of preys without damaging the plants. Spiders are one of the dominant predatory groups found in ecosystems in India. They have special adaptations towards a predatory way of life. Their distensible abdomens enable them to consume large amounts of food in relatively short periods of time, while their rate of predation may greatly increase during short periods when plentiful supply of food is available. They have an exceeding high resistance to starvation, which enables them to survive and maintain normal reproduction during periods of low prey availability. Spiders are the most common ubiquitous animals on land, constitute an essential portion of the predatory arthropods in several ecosystems. Spiders are known to occupying most of the terrestrial habitats. They are generalist predator, which can act against a broader range of insect pests. Sunderland K. and Samu F. (2000).

Spider species abundance in ecosystem can be high as undisturbed natural ecosystem. Spiders act as pest control creature, which feeds on crop destructive insects. Spiders are beneficial bio-control agent of insect pest in ecosystem. S. Jeyaparvathi, S. Baskaran and G. Bakavathiappan (2013).

Spiders are known to occupying most of the terrestrial habitats. They are generalist predator, which can act against a broader range of insect pests. Spiders are considered to be of economic value to farmers as they play valuable role in pest management by consuming large number of preys in the agriculture fields without any damage to crops. In spite of their importance as generalist predator, the role of spiders in ecosystems is usually ignored, mainly because spiders do not fit the conventional profile of biological control agents. Spiders are among the most abundant insectivorous predators of Terrestrial ecosystem. The current global

list of spider fauna is approximately 44,057 belonging to 3928 genera and 110 families (Platnick N. I. 2019). Spiders are an important but generally poorly studied group of arthropods that play a significant role in the regulation of insect pests and other invertebrate populations in most ecosystems. Spiders play an important role in insect pest control without any harm to ecosystem. Recently in agricultural fields reduced pesticide use and ecological sustainability have led to increased interest in spiders as potential biological pest control agents. Spiders act as natural biological control agent in ecosystem. Some recent workers on Indian spiders include Majumdar and Tikader (1991), Reddy and Patel (1992), Biswas and Biswas (1992), Sadana and Goel (1995), Biswas et al. (1996), Gajbe, U. A. (1999), Biswas and Majumdar (2000), Biswas B. and K. Biswas (2003). A survey of Spiders was carried out in Agro ecosystem of Wardha District during October 2024 – October 2025.

II. MATERIALS AND METHODS:

Study Area: Wardha is the most diversity rich agro-ecosystem. It is located on the Nagpur Highway. It is situated in Vidarbha region of Maharashtra and is 680 km from the state capital, Mumbai. Wardha is situated on the Samrddhi Marg of the Vidarbha Regions of Maharashtra. Wardha is subdivided into eight tehsils. Wardha is located between N20.21° and E79.15° with an elevation on 745 meters. Cool climate in the city when compared to Vidarbha region. Summer is also not so hot as compared to other Vidarbha regions. The annual rainfall averages 750 mm. Total area under forest is 80 sq km. It is dry deciduous type and mixed type of forest with some grassland forest. The area receives rainfall during southwest monsoon. Average temperature of the district ranges from minimum of 11°C in winter to a maximum of 45°C in summer with the relative humidity varying from 10-16% to 60-90%. The spider inventory studies were conducted from October 2024 to October 2025 in the five different Agroecosystems of Wardha district from Maharashtra state. I have selected five microhabitats for observations in the study area viz; agricultural land.

Sampling methods: Spider Inventory work was conducted at the ecosystems by different groups of Table No. 1 Checklist of Spider Species from Agro-ecosystems of Wardha district. Maharashtra State

workers. Four surveys were conducted per season at all study sites. Five 25 x 25 m quadrates were taken for extensive surveys. All surveys were conducted in the morning hours between 7:00 am to 9:00 am Spiders were collected by adopting standard sampling techniques as described below.

1. Sweep netting:

Spiders from herbaceous-shrub-small tree vegetation were collected using standardized insect-collecting net. This method is used to collect the foliage spider by this method from herbs and shrubs.

2. Beating sheets:

Spiders from trees and woody shrubs were dislodged and collected on a sheet by beating trees and shrubs with a standard stick. 10 beats per tree or shrub were employed in each quadrat.

3. Active searching and hand picking:

Spiders from all three layers were collected using this method. In this method spider specimens were actively searched for 30 minutes per quadrat for searching under rocks, logs, ground debris, and loose dead barks of trees etc.

4. Litter Sampling:

Litter i.e., deciduate from the ground was collected by hand and was put in big tray. Litter sampling involved sorting of spiders from litter collection tray. Collected spiders were photographed in live and later observed and studied. Identification of Spiders were observed using stereo zoom microscopes for studying identification keys. All Spiders are identified to the family level. Spiders were identified upto species level using the standard monographs, Majumder S.C. and Tikader B. K. (1991).

III. RESULT

During the present study I have reported 139 species of Spiders belonging to 14 Families and 43 genera. Spiders of Families Araneidae, Clubionidae, Eresidae, Gnaphosidae, Lycosidae, Oecobidae, Oxyopidae, Pholcidae, Salticidae, Sparassidae, Tetragnathidae, Theridiidae, Thomisidae and Uloboridae were recorded during the investigation.

Sr. No.	Family	Genera	Species
1	ARANEIDAE	12	48
2	CLUBIONIDAE	01	03
3	ERESIDAE	01	02
4	GNAPHOSIDAE	04	08
5	LYCOSIDAE	03	18
6	OECOBIIDAE	01	02
7	OXYOPIDAE	02	09
8	PHOLCIDAE	02	02
9	SALTICIDAE	07	22
10	SPARASSIDAE	01	02
11	TETRAGNATHIDAE	01	02
12	THERIDIIDAE	01	02
13	THOMISIDAE	06	16
14	ULOBORIDAE	01	03
Total		43	139

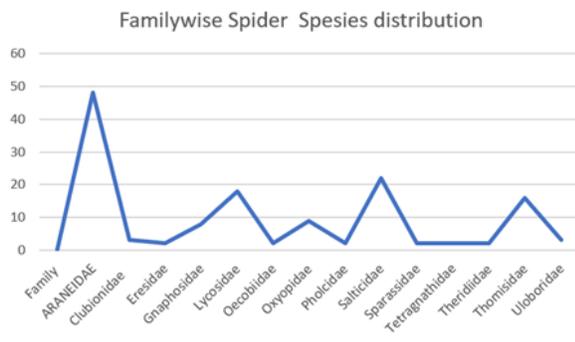


Fig. 1. Graph showing family wise Spider Species distribution.

IV. DISCUSSION

In the present study, 139 species of spiders belonging to 43 genera of 14 families in Wardha district collected and identified. These spiders were belonging to the family Araneidae, Clubionidae, Eresidae, Gnaphosidae, Lycosidae, Oecobiidae, Oxyopidae, Pholcidae, Salticidae, Sparassidae, Tetragnathidae, Theridiidae, Thomisidae and Uloboridae. In this study two species of spiders were observed, one is web weaver and another one is non web weaver. The web weaving spiders were belonging to the family Araneidae, Eresidae, Oecobiidae, Pholcidae, Tetragnathidae, Theridiidae, and Uloboridae. The non web weaving spiders were belonging to the family Clubionidae, Gnaphosidae, Lycosidae, Oxyopidae, Salticidae, Sparassidae and Thomisidae. The increase

in the spider density suggests that spider density in influenced by the increase in prey density. In particular, the interaction of prey and predator shows a constant numerical interaction about these relationships which is fundamental to biological control. Spiders are considered as the favorable biological control agents in the Agro ecosystem. In my investigation I have seen that the abundance of Five Family Spiders species was more. For details I have arranging the data in a Table 2 Format of systematic way. The abundance of Spider families is represented as:

Araneidae 34 > Lycosidae 20 > Thomisidae 14 > Salticidae 12 > Oxyopidae 09.

Mostly Araneidae family spiders are in Cotton field. Thomisidae spiders are more because Sunflower field are in large numbers. Major Five Families i. e. Araneidae, Lycosidae, Thomisidae, Salticidae and Oxyopidae having occupying maximum percentage area in agro-ecosystems.

V. CONCLUSION

During investigation I have studied 139 species belonging to 43 genera of 14 spider Families. On the above result and discussion, it is clear that the Spiders are very much important creature. Species abundance of spider in agro ecosystem can be high. Spiders are beneficial bio-control agent of insect pest in the Agro ecosystem.

Spider's predatory capacity can have an effect in decreasing densities of insect pests, when they are used to balance the effect of insecticides and Pesticides. Some spiders are among the most effective predators of leafhoppers, caterpillars, and other pests. Aphids are rarely important pests of Cotton. Some Spiders and Spider lings are main control agents of aphids. Most spiders' feeds on insects that's why productivity of crop gets increased, hence spiders are important Pests control agents.

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