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Spiders Diversity in Agro-ecosystem of Tahsil Sindkhed Raja, District Buldhana (M. S.)

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Abstract:

Spiders are one of the most diverse animal groups in the World. Spiders are widespread and diverse predators that are part of terrestrial Arthropod assemblages. Spiders play an important role as stabilizing agents or regulators of insect populations in agro and other terrestrial ecosystems. Thus, their presence in an ecosystem may well influence the population dynamics of other arthropods present. Spiders play an important role in insect pest control. Recently in agricultural fields reduced pesticide use and ecological sustainability have led to increased interest in spiders as potential natural biological pest control agents. Considerably insect populations increases when release from predations by spiders. Regularly use of pesticides in agricultural fields which decreases the spider populations.

Spider species abundance in agro-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 agro-ecosystem. A survey of Spiders was carried out in Agricultural Fields of Sindkhed raja, District Buldhana during July 2024 – January 2025. During the present study I have reported 184 species of Spiders belonging to 12 Families and 68 genera. Spiders of Families ARANEIDAE, CLUBIONIDAE, ERESIDAE, GNAPHOSIDAE, LYCOSIDAE, OXYOPIDAE, SALTICIDAE, SPARASSIDAE, TETRAGNATHIDAE, THERIDIIDAE, THOMISIDAE and ULOBORIDAE were recorded during the investigation. This article presents a study on the distribution and current status of spider families in these agricultural fields of Sindkhed raja, Buldhana District.

Keywords: Diversity, Agricultural Fields, Spiders, Sindkhed raja

Introduction:

In India the conservation efforts have focused on higher vertebrates and Invertebrates have largely been ignored. The arachnids are important group. 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 have unique habitat and they live in almost all the environments. They are the richest predator of insects of terrestrial ecosystem and consume large number of preys without damaging the plants. Spider can regulate large population of insect and other invertebrate in most ecosystems Russell Smith [10]. Spiders are the most common everywhere animals on land, constitute an essential portion of the predatory arthropods in several ecosystems.

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 Jeyaparvathi S, et al [11]. 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 prey in the agriculture fields without any damage to crops. Spiders are among the most abundant insectivorous predators of Terrestrial ecosystem. The current global list of spider fauna is approximately 44,428 belonging to 3928 genera and 110 families Platnick NI [8].

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. Some recent workers on Indian spiders include Majumdar and Tikader [13], Reddy and Patel [9], Biswas and Biswas [2], Sadana and Goel [12], Biswas et al. [3], Gajbe [6], Biswas and Majumdar [4], Biswas and Biswas [5], Asarkar and Ade [1]. A survey of Spiders was carried out in Agro-ecosystem of Sindkhed raja Tahsil of District Buldhana during July 2024 – January 2025.

Materials and Methods:

Study Area:

Sindkhed raja Tahsil, district Buldhana belongs to Vidarbha region. Sindkhed raja is a large town in the district of Buldhana in central Maharashtra. Sindkhed raja Tahsil, district Buldhana is located between N19.9667° and E76.1333° with an elevation on 549 meters (1801 ft). It is dry deciduous type and mixed type of forest with some grassland forest. Average temperature of the district ranges from minimum of 11^{o}C in winter to a maximum of 42^{o}C in summer with the relative humidity varying from 10-15% to 65-95%.

The spider inventory studies were conducted from July 2024 to January 2025 in the five different Agroecosystems of Sindkhed raja, district Buldhana from Maharashtra state. I have selected four microhabitats for observations in the study area.

Sampling Methods:

Spider Inventory work was conducted at the ecosystems by different groups of 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 10:00 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. 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.
3. 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.

Collected spiders were photographed in life and later preserved in 70% ethyl alcohol. Identification: Spiders were observed using stereo zoom microscopes for studying identification keys. All specimens were initially separated from other material and identified to the family level. Spiders were identified upto species level using the standard monographs, Majumder SC and Tikader BK [7].

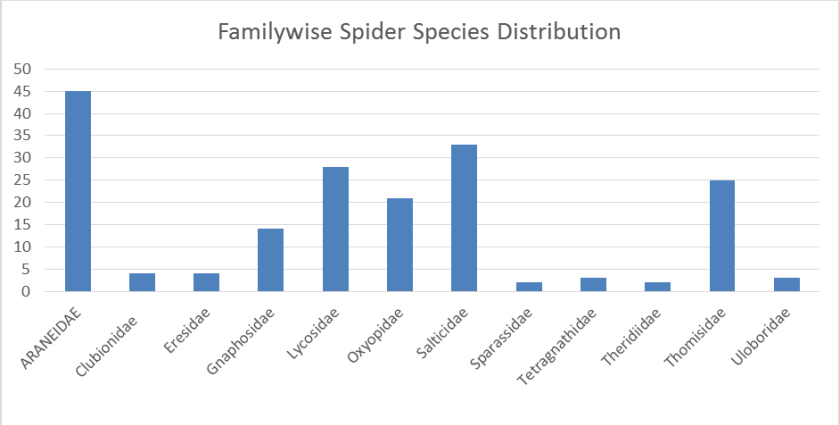
Result:

During the present study I have reported 184 species of Spiders belonging to 12 Families and 68 genera. Spiders of Families ARANEIDAE, CLUBIONIDAE,

ERESIDAE, GNAPHOSIDAE, LYCOSIDAE, OXYOPIDAE, SALTICIDAE, SPARASSIDAE, TETRAGNATHIDAE, THERIDIIDAE, THOMISIDAE and ULOBORIDAE were recorded during the investigation.

Sr. No.	Family	Genera	Species
01	ARANEIDAE	15	45
02	CLUBIONIDAE	02	04
03	ERESIDAE	02	04
04	GNAPHOSIDAE	04	14
05	LYCOSIDAE	12	28
06	OXYOPIDAE	07	21
07	SALTICIDAE	13	33
08	SPARASSIDAE	01	02
09	TETRAGNATHIDAE	01	03
10	THERIDIIDAE	01	02
11	THOMISIDAE	08	25
12	ULOBORIDAE	02	03
Total		**68**	**184**

Table No. 1: Checklist of Family wise Spider species from Agricultural fields of Sindkhed raja, district Buldhana. (Maharashtra State).



Graph 1: Graph showing Occurrence of Family wise Spider Species Numbers in Agricultural fields of Sindkhed raja Tahsil of District Buldhana (Maharashtra State).

Discussion:

During the present study I have reported 184 species of Spiders belonging to 12 Families and 68 genera. Spiders of Families ARANEIDAE, CLUBIONIDAE, ERESIDAE, GNAPHOSIDAE, LYCOSIDAE, OXYOPIDAE, SALTICIDAE, SPARASSIDAE, TETRAGNATHIDAE, THERIDIIDAE, THOMISIDAE and ULOBORIDAE were recorded during the investigation.

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, 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 1 Format of systematic way. The abundance of Spider families is represented as:

ARANEIDAE 45 > SALTICIDAE 33> LYCOSIDAE 28 > THOMISIDAE 25 > OXYOPIDAE 21

Conclusion:

During investigation I have studied 184 species belonging to 68 genera of 12 spider Families. On the above result and discussion, it is clear that the Spiders are very much important creature. Spiders are beneficial bio-control agent of insect pest in the Agricultural fields.

Spiders are voracious feeder due to decreasing densities of insect pests. Some spiders are among the most effective predators of leafhoppers, caterpillars, and other pests. Aphids 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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