



Diversity of Spiders in Agricultural Fields of Sangrampur tahsil, Dist. Buldhana. (M. S.)

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ABSTRACT

Spiders are insectivorous predators on earth. They feed on insects and consume large number of preys without damaging the crops. Spiders, are the most common ubiquitous animals on land, constitute an essential portion of the predatory arthropods in several ecosystems. 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. A survey of Spiders was carried out in Taluka Sangrampur of Buldhana District during September 2023 - February 2024. This article presents a study on the Diversity, distribution and current status of spider families in Sangrampur Tahsil of Buldhana District. During the present study we have reported 125 species of Spiders belonging to 12 Families and 37 genera. Spiders of Families ARANEIDAE, CLUBIONIDAE, ERESIDAE, GNAPHOSIDAE, LYCOSIDAE, OXYOPIDAE, SALTICIDAE, SPARASSIDAE, TETRAGNATHIDAE, THERIDIIDAE, THOMISIDAE and ULOBORIDAE were recorded during the investigation.

Keywords: Diversity, Spider, Agricultural Fields, Sangrampur.

INTRODUCTION:

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. Spiders are the most common everywhere animals on land, constitute an essential portion of the predatory arthropods in several ecosystems. Spiders are belonging to phylum Arthropoda class Arachnida and order Araneae (Singh Anita et al., 2021). Since Spiders belong a group of most diverse organism it is necessary to study its diversity as it has been previously neglected or ignored (Fernandes Selifa and S. Ganesh). Spiders represent the second largest order within the arachnids (Andrews and Jose; 2021). Spiders form one of the most fascinating animal groups in the world. The World Spider Catalog, WSC (2022) version 23.0. has announced that 50,144 known different species of spider crawling the Earth. The study area is a human dominated landscape, they are facing threats like habitat loss, laterite mining, pollution and changes in land use pattern. Appropriate conservation strategies should be developed. In conclusion it can be said that we need to have understand more about spider's diversity as they are important as bioindicators of our environmental changes.

Spiders are ubiquitous invertebrate predators in terrestrial ecosystems. relatively small in body size, and their body length ranges from 0.37–90 mm. Males are usually smaller than the females and possess shorter life span (das sandipan *et. al.*, 2021). Spiders exhibit stunning morphological diversity and coloration (Malhotra Gs 2019). They are widely distributed predaceous organism and explore almost every possible type of habitats. The occurrence and distribution of the spiders in a variety of microhabitats functions as a bio-indicator of that area and their presence is influenced greatly by the corresponding habitat and vegetation types.

The spiders play important role in maintaining biological balance of nature. Spiders can play an important role in stabilizing or regulating insect populations in agriculture as well as in forest ecosystem. Biological control through spiders is one of the best strategies to reduce the use of chemical pesticides as well as the population of the insect pests. Spiders are terrestrial carnivores and they can contribute to prey reduction and regulation of insects. They are used as the natural enemies of pests in several key crops. They feed only on living creatures especially arthropods like moths, butterflies, flies, aphids, thrips, beetles, ants, bugs, bees and other arachnids including spiders (Sreekumari C. 2002).

Their body have two segments, Cephalothorax (Prosoma) have four pair of legs with hair and spines on legs and abdomen with no segments and wings. They are different from Insects because of lack of segments on abdomen, wings and 8 legs instead of 6 legs in Insects. Chelicerae is specialized pointed appendages in the spiders which is found between first pair of legs and help in grasping the prey and venom injection. consume only liquid due to lack of chewing mouthparts. (Anita Singh *et.al* 2021). Jumping is most obvious in the salticids, although many other hunting spiders (lycocids, clubionids, and oxyopids) are also capable of at least short leaps Spiders kill or paralyse their prey swiftly stabbing with a pair of appendages called chelicerae which have evolved into hollow dagger like fangs that inject a powerful venom. Having prepared the meal, a spider digests it before

ingesting it, pumping a secretion into the victim's body that liquefies body tissues, the spider then sucks out the predigested juices (Punjoo Shazia, 2015).

The spiders daily construct a new web with the help of energy help accumulated from the food they get. The spiders specially orb weaving spiders make their webs at night time and usually take them down in the morning Blackledge et. al (2001; 2004). Their webs are wonders of natural architecture.

Egg Sac of spider - Female spiders produce either one egg sac containing several to a thousand eggs or several egg sacs each with successively fewer eggs. Females of many species die after producing the last egg sac. Wolf spider females carry egg sacs attached to the spinnerets; in fact, this is one of the defining behaviours of lycocids. As might be expected, females are very protective of their egg sacs and will fight to prevent their removal. If the female is attacked by a predator which grasps the egg sac, or if the egg sac becomes snagged on something as the female moves through the habitat. If the egg sac is lost or removed. a female may become agitated and search the surrounding area; if the egg sac is located, she will then reattach it to her spinnerets (Brown Christopher 2018).

MATERIAL AND METHOD

Study area: Sangrampur Tahsil, district Buldhana belongs to Vidarbha region, 135 km to Vidarbha capital of Nagpur & 610 km to State capital of Mumbai. Sangrampur Tahsil, district Buldhana is located between N21.03° and E76.68° with an elevation on 273 meters (896 ft). Sangrampur is an important center for the Cotton and Soybean trade. It is dry deciduous type and mixed type of forest with some grassland forest. Average temperature of the district ranges from minimum of 5.7°C in winter to a maximum of 45°C in summer with the relative humidity varying from 08-12% to 60-90%.

The spider inventory studies were conducted from September 2023 to February 2024 in the five different Agricultural Fields of Sangrampur, district Buldhana from Maharashtra state. We have selected four microhabitats for observations in the study area.

Methods of Collection: -

- (a) **Field Methods:** Well standard sampling protocols were adopted for spider collection in different sites of sampling. The detailed descriptions of this collection techniques are-
- (i) Sweep Netting- this method is used to collect the foliage spiders is collated by this sampling method from herbs shrubs and low level vegetation (up to 2 m in height). The sweep net consists of a 90 cm handle; 40 cm ring.
 - (ii) Ground Hand Collecting- Knee level spider samples collected from this collection method. This method of sampling is used to collect the spiders, in the ground, litter, in broken logs, rocks which are found to be visible.
 - (iii) Aerial Hand Collecting- This collection method involved the collection of species of spiders from knee level to arm length level. This method accessed free-living and web-building spiders on the stems of living or dead shrubs, high herbs, foliage and tree trunks etc.
 - (iv) Vegetation Beating- This method is used to accesses spiders living in the shrub, high herb vegetation, bushes, branches and small trees. In this method spiders were collected on a cloth (1 m by 1.2 m) by beating high herbs vegetation, dead shrubs and high herbs with a stick.
 - (v) Litter sampling- Specimens were collected by hand. Litter sampling involves sorting of spiders from the litter collection tray.
 - (vi) Pitfall sampling- Wet pitfall trap method was used to study the ground dwelling spiders. The pitfall traps consisted of a 9 cm wide by 16 cm deep plastic jar, two-third filled with 70% ethyl alcohol and a few drops of liquid soap/detergent. The pitfall traps were left open for a period of three days. The distance between two adjacent jars was 5 meter.

Result:

During the present study we have reported 125 species of Spiders belonging to 12 Families and 37 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	09	33
02	CLUBIONIDAE	01	03
03	ERESIDAE	01	03
04	GNAPHOSIDAE	04	08
05	LYCOSIDAE	07	26
06	OXYOPIDAE	02	10
07	SALTICIDAE	04	14
08	SPARASSIDAE	01	02
09	TETRAGNATHIDAE	01	03
10	THERIDIIDAE	01	02
11	THOMISIDAE	05	18

12	ULOBORIDAE	01	03
	Total	37	125

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

Discussion:

During the present study I have reported 125 species of Spiders belonging to 12 Families and 37 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 is 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:


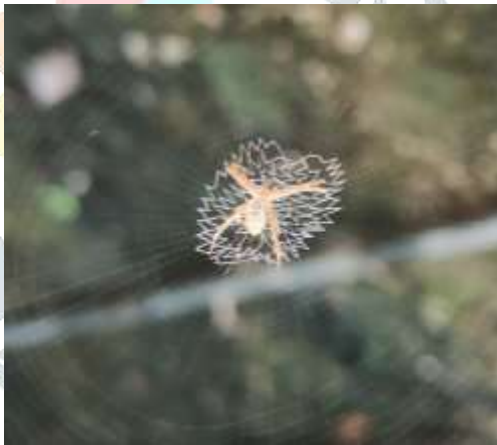


ARANEIDAE 33 > LYCOSIDAE 26 > THOMISIDAE 18 > SALTICIDAE 14 > OXYOPIDAE 10.

Conclusion:



During investigation I have studied 125 species belonging to 37 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.





Family :- Araneidae

	
<i>Argiope aemula</i> (female)	<i>Argiope keyserlingi</i>
	
<i>Argiope aemula</i> (female)	<i>Argiope aemula</i> (male)

Family :- Lycosidae

	
<p><i>Pardosa sp</i></p>	<p><i>Hippasa sp</i> female with egg sac</p>

Family :- Salticidae

	
<p><i>Telemonia dimidiata</i></p>	<p><i>Pseudicius sp</i></p>
	
<p><i>Menemerus bivittatus</i></p>	<p><i>Telemonia dimidiata</i> (male)</p>

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