DIVERSITY OF SPIDERS IN AGRO-ECOSYSTEMS OF TAHSIL SANGRAMPUR, DISTRICT BULDHANA (MAHARASHTRA STATE)

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ABSTRACT

Spiders are among the most abundant insectivorous predators of Terrestrial ecosystem. Spiders are widespread and diverse predators that are part of terrestrial Arthropod assemblages. Spiders are one of the most diverse animal groups in the World. Their presence in an ecosystem may well influence the population dynamics of other arthropods present. Spiders play an important role in insect pest control without any harm to agro-ecosystem. Recently in agricultural fields reduced pesticide use and ecological sustainability have lead to increased interest in spiders as potential 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 plays an important role in regulating insect pests in the Agricultural Ecosystem. They mostly feed on insects, even though they may also feed on various other kinds of prey. 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. If pesticides are avoided, spiders can invariably take shelter in the fields, feed on the pests and increase the productivity. The role of spiders as generalist predator in an agroecosystems is well recognized. 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 Agro-ecosystems of Sangrampur Tahsil, District Buldhana. During the present study I have reported 143 species of Spiders belonging to 11 Families and 63 genera. Spiders of Families ARANEIDAE, ERESIDAE, GNAPHOSIDAE, LYCOSIDAE, OXYOPIDAE SALTICIDAE, SPARASSIDAE, TETRAGNATHIDAE, THERIDIIDAE, THOMISIDAE, and ULOBORIDAE were recorded during the investigation. A survey of Spiders was carried out in Agro ecosystem of Sangrampur Tahsil, District Buldhana during August 2016 – May 2017.

Keywords: *Diversity, Agro-ecosystems, Spider, Sangrampur.*

Introduction

Spiders are among the most abundant insectivorous predators of Terrestrial ecosystem. Biodiversity can be simply defined as the variety of all types of living organism. Spiders are among the most diverge group on earth, which received the sixth ranking in global diversity after the sixth largest insect orders. Spiders belonging to the order Araneae, which is one of the major group of creature. Spiders play an important role in insect pest control without any harm to agro-ecosystem. Recently in agricultural fields reduced pesticide use and ecological sustainability have lead to increased interest in spiders as potential 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. Spiders are one of the most important Arthropods group in agroecosystems. They colonize almost all habitats and have great ability in resisting to adverse ecological conditions. Spiders are carnivorous creature.

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 Agro-ecosystems of Sangrampur Tahsil, district Buldhana. 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 agro-ecosystems. Recently in agricultural fields reduced pesticide use and ecological sustainability have lead to increased interest in spiders as potential biological pest control agents. 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 Sangrampur Tahsil, District Buldhana during August 2016 – May 2017.

Materials and Methods

Study Area

Sangrampur is the diversity rich agro-ecosystem in Buldhana District. It is situated at the westernmost border of Vidarbha region of Maharashtra and is 650 km from the state capital, Mumbai. Sangrampur is a small town in Maharashtra state. The settlement emerged as a small farmer's village about 2 centuries ago, and it has been developing quite slowly but steadily.

Sangrampur is located between N21.03°and E76.68°with an elevation on 580 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 870 mm. The area receives rainfall during southwest monsoon. Average temperature of the district ranges from minimum of 9oC in winter to a maximum of 44oC in summer with the relative humidity varying from 10-17% to 60-90%.

The spider inventory studies were conducted from August 2016 to May 2017 in the ten different localities of Sangrampur Tahsil, Buldhana district from Maharashtra state. I have selected Ten microhabitats for observations in the study area viz; agricultural land.

Sampling methods

Spider Inventory work was conducted at the agro-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. 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. Direct searching: Spiders from all three layers were collected using this method. In this method spider specimens were actively searched for 30 minutes per quadrat for active searching.
4. Litter Sampling: Litter i.e. deciduate from the ground was collected by hand and was put in big tray. Litter sampling involved in sorting of spiders.

Collected spiders were photographed in life and later preserved in 70% ethyl alcohol. Spiders Identification 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, Muzumdar S.C. and Tikader B. K. (1991).

Result

The spider inventory studies were conducted from August 2016 to May 2017, during the present survey; I have reported 143 species of Spiders belonging to 11 Families and 63 Genera. Spiders of Families ARANEIDAE, ERESIDAE, GNAPHOSIDAE, LYCOSIDAE, OXYOPIDAE SALTICIDAE, SPARASSIDAE, TETRAGNATHIDAE, THERIDIIDAE, THOMISIDAE and ULOBORIDAE were recorded during my investigation.

Table 1: Checklist of Spider fauna from Agro-ecosystems of Sangrampur Tahsil in Buldhana district of Maharashtra State

Sr. No.	Family	Genera	Species
01	Araneidae	19	42
02	Eresidae	01	02
03	Gnaphosidae	03	08
04	Lycosidae	12	25
05	Oxyopidae	04	13
06	Saltisidae	11	23
07	Sparassidae	01	02
08	Tetragnathidae	02	04
09	Theridiidae	02	04
10	Thomisidae	07	17
11	Uloboridae	01	03
Total		**63**	**143**

Discussion

The spider inventory studies were conducted from August 2016 to May 2017, during the present survey; I have studied 143 species of spiders belonging to 63 genera of 11 families in agro-ecosystem of Sangrampur Tahsil, district Buldhana collected and identified. These spiders were belonging to the family Araneidae, Eresidae, Gnaphosidae, Lycosidae, Oxyopidae, 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, Tetragnathidae, Theridiidae, and Uloboridae. The non web weaving spiders were belonging to the family 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.

OrbWeaver(ARANEIDAE)>WolfSpider(LYCOSIDAE)>JumpingSpider(SALTICIDAE)> Crab Spider(THOMISIDAE)> Lynx Spider(OXYOPIDAE) On the basis of Family wise Spider Species the abundance of the Spider Family are represented respectively. In my investigation I have seen that the abundance of Five Family Spiders species were more.

Conclusion

In my investigation conducted from August 2016 to May 2017, I have studied 143 species belonging to 63 genera of 11 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. The present work includes the Taxonomic position and list of diversified species of spiders. The major families abundant in this agro-ecosystem are ARANEIDAE 42, LYCOSIDAE 25, SALTICIDAE 23, THOMISIDAE 17 and OXYOPIDAE 13. Spiders are act as good Pest controller. Avoid the regular use of pesticides in agricultural fields which decreases the spider populations, so species abundance of spider in agro-ecosystem can be high. Spiders are beneficial bio-control agent of insect pest in agro-ecosystem.

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