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**A Preliminary study on Spider Diversity at Wani, District Yavatmal (M.S.)  
India**

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**Abstract:**

*The current study examines the diversity and abundance of spiders in the agro-ecosystem of Wani, Yavatmal district, Maharashtra, India. Using quadrants, we collected spiders from cotton, Soyabean and tur cultivated areas. During the seven months of the study, we collected 103 spider individuals belonging to three families under thirteen genera and twenty eight species. The Araneidae family is more abundant than the Lycosidae and Salticidae families, with the highest number of species belonging to the Araneidae family followed by these two families.*

**Keywords:** Araneidae, Lycosidae, Salticidae, Agroecosystem.

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**Introduction:**

As all-purpose predators, spiders have the potential to be a biological agent that helps manage insect pests in agricultural environments. Spider species were quite diverse in the natural environment, even in agriculture. The diversity of spiders in temperate regions has been extensively researched, but tropical regions have gotten very little attention. Numerous studies demonstrate that spiders can drastically lower the density of pests like aphids (Aphidae), thrips (Thysanoptera), and leafhoppers (Cicadellidae). In the globe, there are 46,617 species of spiders. Pocock (1900) gave the first detailed account of Indian spiders, including 216 different species. Numerous studies have demonstrated that when insects are freed from spider predation, their numbers drastically decline.

Because they are at the top of the invertebrate food chain and exhibit the highest levels of diversity and abundance, spiders are extremely important to the

environment (Simon, 1887-1906). Species diversity is influenced by a wide range of environmental conditions (Biswas *et al.*, 1992). Since spiders are insectivores, the insect fauna varies as the flora does. Spider diversity and abundance in agricultural fields are reduced by a number of factors, including habitat loss (Deshmukh and Raut, 2104), the direct and indirect effects of pesticides and herbicides (Jeyaparvathi *et al.*, 2013; Bade and Ade, 2017), increased use of fertilizers and drainage (Kumar and Shiva kumar, 2006), the loss and degradation of field boundary features (Lemke and Poehling, 2002), and shifting cropping patterns (Gajbe, 2004).

Therefore, whether they are found in homes or fields, spiders serve as biological control agents. These spiders are very important to agriculturists, entomologists, and ecologists who study natural and biological management since they are mostly entomophagous, meaning they feed on a variety of insects and insect pests (Siliwal and Kumar, 2001, 2002; Bade and

Ade, 2017). However, it is still unclear how they function as biological control agents in agro-ecosystems. Over the past ten years, a wealth of new information about spider behaviour in various agro-ecosystems has become available, raising awareness of spiders as useful organisms.

### Materials and Methods:

**Study Area:** The Indian state of Maharashtra's Yavatmal district contains the city of Wani. It is located on the Yavatmal-Chandrapur road, approximately 107 kilometres from Yavatmal, on the eastern side of the Yavatmal district. Nirguda flows from the western side of Wani to the riverside where Wani is situated. Wani is situated at 228 meters above mean sea level (AMSL), at coordinates 20°07'N, 78°95'E.

**Sampling:** Every month, samples were taken using the quadrates method, which used a visual search strategy between 6 and 9 am to gather spiders from a single quadrat (25 square meters by 25 square meters) that was positioned at four corners and one centre of the 25 square meters by 25 square meters area. Spider specimens from the quadrat were brought to the laboratory. The fresh specimen was photographed dorsally, laterally, and ventrally for identification using the Steriozoom microscope before being preserved in 70% alcohol.

**Collection methods:** Spiders were gathered from several agro-ecological habitats in the Wani tahsil of Yavatmal district. Spiders were collected using the following techniques:

**i) Direct Hand Picking:** Using test tubes or sample collection tubes, the majority of web-building spiders were collected by direct hand picking.

**ii) Visual Search:** Use a little stick, leaves, paper, jar, etc. to visually search for spiders, capture them, or collect them, and then move them into collecting tubes.

**iii) Inverted Umbrella:** This technique involved placing an inverted umbrella

among low flowering shoots and shrubs. Spiders and insects fell beneath the inverted umbrella when the tree or branch was shook vigorously. Spiders were moved into collecting tubes after their leaves were removed.

### Observation and Result:

The spider diversity of cotton, soybean, and tur agricultural farms was surveyed. According to the population dynamics analysis, there are 103 members of three families: the Araneidae (77), Lycosidae (24), and Salticidae (2). The Araneidae has the greatest number of species, followed by Lycosidae and Salticidae (table-1). According to this study, members of the Araneidae family are dominating over the other members of the Lycosidae and Salticidae families (fig.-1). Family Araneidae is represented by 10 genera and 23 species, family Lycosidae show presence of 2 genera and 4 species while family Salticidae is represented by only one genera and single species.

### Discussion:

Twenty eight spider species belonging to three families were identified for the current study from agro-ecosystem of Wani, Yavatmal district, Maharashtra, India. These spiders belonged to the Araneidae, Lycosidae, and Salticidae families. Weavers and non-weavers are the two sorts of spiders that were seen in this instance. Spiders that weaved webs were members of the Araneidae and Lycosidae families. The Salticidae family included the spiders that did not weave webs. The species *Neoscona theisi* was the most prevalent among the individuals that were identified. Keswani and Vankhede (2014), Shirbhate and Shirbhate (2017) and Bade and Ade (2017) observed similar findings.

Seasonal variations and harvesting in neighbouring fields to find a new niche could be the causes of the fluctuations in

different months. In the agro-ecosystem, spiders are regarded as beneficial biological control agents. Spiders are widely distributed across the nation. Because of their predatory capacity, they are an integral part of all ecosystems and clearly contribute to the balanced ecology. They can be found in trees, bushes, hedges, and shrubs. The cotton field has shown seasonal change in spider population dynamics; the highest number of web-weaving individuals was reported in November, while the lowest number was recorded in February.

### Conclusion:

We deduced from the aforementioned study that spiders are a significant component of nature that aids in the management of the agro-eco system's pest population. The field and other organisms are not harmed by the biological management of the pest population. Different spider species were impacted by pesticide application.

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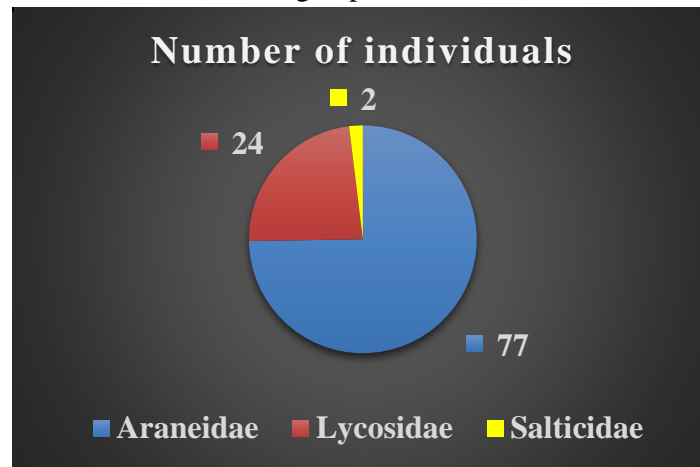
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**Table-1:** Checklist and number of spider species observed from agro-ecosystem of Wani, Yavatmal district, Maharashtra during September 2022- March 2023.

Genera/ Species	No. of Individuals	% Species
<b>Family: Araneidae</b>		
<i>Araneus ellipticus</i> Female	3	2.91
<i>Argiope aemula</i> Female	2	1.94
<i>Chorizopes bengalensis</i> Female	2	1.94
<i>Cyclosa bifida</i> Male, Female	4	3.88
<i>Cyclosa hexatuberculata</i> Female	3	2.91
<i>Cyrtophora cicatrosa</i> Female	2	1.94
<i>Eriovixia excelsa</i> Female	4	3.88
<i>Eriovixia laglaizei</i> Female	2	1.94
<i>Gasteracantha cancriformis</i> Female	2	1.94
<i>Larinia chloris</i> Female	3	2.91
<i>Larinia argiopiformis</i> Female	2	1.94
<i>Larinia lineate</i> Female	2	1.94
<i>Neoscona adianta</i> Female	2	1.94
<i>Neoscona bengalensis</i> Female	3	2.91
<i>Neoscona crucifera</i> Female	3	2.91
<i>Neoscona mukerjei</i> Female	3	2.91
<i>Neoscona nautica</i> Female	3	2.91
<i>Neoscona punctigera</i> Female	3	2.91
<i>Neoscona theisi</i> Male, Female	17	16.50
<i>Neoscona vigilans</i> Female	4	3.88
<i>Poltya nagpurensis</i> Female	3	2.91
<i>Poltya illepidus</i> Female	3	2.91
<i>Zygiella indica</i> Male, Female	2	1.94
<b>Family: Lycosidae</b>		
<i>Hippassa</i> Sp.	4	3.88
<i>Pardosa amentata</i>	6	5.83
<i>Pardosa agrestis</i>	6	5.83
<i>Pardosa agricola</i> Male, Female	8	7.77
<b>Family: Salticidae</b>		
<i>Sassacus vitis</i> male	2	1.94

**Figure-1:** Graph showing Family wise number of individuals observed from agro-ecosystem of Wani, Yavatmal district, Maharashtra during September 2022- March 2023.



**Abstract:**

*Intellectual property rights are those that are awarded to the creator of a new invention or intangible asset together with permission to profit monetarily or commercially from that resource. The first federal law pertaining to patents was approved in 1790, marking the beginning of the development of the idea of intellectual property in the 18th century. Although the extent of intellectual property rights varies by economy, in general, IPR regulations protect any kind of invention or creative work that comes under the purview of copyright and patent law. One of the business models that relies on IPR and licenses the most is e-commerce. E-commerce allows users to trade IP-protected products like software, blueprints, training materials, and systems rules that are the primary source of value. Since all types of security-based intellectual property regulations should protect valuable commodities under e-commerce, otherwise, entire businesses run the risk of being pirated. This study examines the history of intellectual property rights (IPR), including the emergence of three main types, their applicability to e-commerce, their function in e-commerce, and the areas of e-commerce that are protected by IPR. This paper is both descriptive and instructive explains how, in a world gone global, IP protection is essential to the growth and the operation of the e-commerce sectors.*

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