



E-ISSN: 2320-7078

P-ISSN: 2349-6800

JEZS 2018; 6(4): 810-813

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Received: 18-05-2018

Accepted: 19-06-2018

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Wheat spider fauna (Araneae) from district Kamber-Shahdadt, Sindh, Pakistan

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Abstract

Present systematic studies conducted in the month of December 2016 to April 2017. 961 wheat spiders were collected and sorted out into four families namely Araneidae, Lycosidae, Oxyopidae and Tetragnathidae, five genera namely Argiope, Lycosa, Pardosa, Oxyopes and Tetragnatha and six species namely *Argiope trifasciata*, *A. Pradhani*, *Lycosa terrestris*, *Pardosa birmanica*, *Oxyopes marginalis*, *Tetragnatha javana*. wheat spiders' species are first time recorded from wheat field of district Kamber-Shahdadt, Sindh, Pakistan.

Keywords: Kamber-Shahdadt, Wheat Spider, Araneidae, Lycosidae, Oxyopidae and Tetragnathidae

Introduction

Spiders are the most significant biological control agents and generalist predator^[1,2]. They are predator in nature and maintain the insect's ecological equilibrium^[3]. They belong to Kingdom-Animalia, Phylum-Arthropoda, Class-Arachnida and Order- Araneae, their group is ranked on 7th number in biodiversity^[4]. Their species are more than identified and observed 47505 species with 4088 genera^[5] and 110 families have been identified^[6]. All spiders are toxic in nature but only 40 different varieties are potentially lethal for humans^[7]. Spiders, which are natural predators, rapacious, voracious as well as carnivorous mostly, use the insects as their food in order to survive^[8]. They are among the most macro invertebrates in the agro-ecosystem^[2,9,10]. They are terrestrial as well as agricultural in nature. The spiders control the pests in agricultural field due to polyphagous nature and they kill the prey with different strategies^[11].

In addition to kill the pest directly, the spiders cause pest's mortality indirectly by dislodging them from the crops or trapping the insects in their webs. They can get equilibrium in the pest control process after which their number is cut down through territoriality and cannibalism^[12]. Spiders show the outstanding and great diversity in their activities of the spiders and life of the spiders particularly in methods of prey capture diurnal rhythms, resting sites and degree of mobility^[13]. It should be noted here the Introduction of (biological control) spider in the crop fields has resulted in the decrease the rate of pest insect's population, which is similar result as seen with pesticides chemicals exercise^[14]. Regrettably the use of such beneficial, the most significant and biological control agent and maintain the pests insects population in nature^[2]. The spider has been ignored in district Kamber-Shahdadt, Sindh. In Pakistan the present knowledge, discussion, science, ecology, biology and genetics about wheat spider fauna is highly restricted. Moreover, the predatory studies, biological studies, ecological studies and possible issues are painfully panic. Before took the important efforts to approximation important functions of spiders to reduce the rate of pest population in the wheat field of district Kamber-Shahdadt Sindh Pakistan.

2. Materials and Methods

Overall 961 wheat spiders were collected during the survey of district Kamber-Shahdadt having seven localities (talukas) namely Kamber, Shahdadt, Warah, Nasirabad, Mirokhan, Sajawal and Qubo saeed khan from the wheat field during the winter season to spring season from the month of December 2016 to April 2017. Wheat spiders were captured from the wheat field by two methods, one of the simplest method to capture large number of wheat spiders is known as Hand picking method from the leaves, Stems, foliage and another method is known

as the Pitfall trapping method to collect also good number of wheat Spiders from the ground of wheat Field.

27 pitfalls were formed randomly in wheat field of sides then spiders were trapped automatically in the pitfalls, which were checked on the weekly basis. Specimen found were removed and preserved in bottles having 70% alcohol with 04 to 05% glycerin. During the month of February 2017 to April 2017 new phenomena was observed that wheat spider formed the Webs and wheat pests such as Aphids, Crickets, Caterpillars, wire worms, Ladybirds, Beetles, Grasshoppers, Butterflies were trapped in webs then trapped pests further folded, paralyzed and stopped their movement and finally eating the wheat pests as a food in order to survive. Mostly web Spiders were collected by hand picking method. Total overall collected wheat spiders were then transported to Araneae

laboratory in plastic bottles and reagent bottles having 70% alcohol with 04 to 05% glycerin. After taking out spiders from the bottles, they were kept in petridishes and wheat Spiders were observed, examined and identified under Stereoscope dissecting binocular microscope with forceps and brush one by one with the help of taxonomical key. The keys were used for examination, identification, observation and systematic studies up to families, genera and species [4]. Full adults having large size of each species of five specimens selected for the measurement of different parameters namely body length, abdomen length, carapace length, abdomen width, carapace width and legs. The identified spiders were then permanently preserved in separate vials containing 70% alcohol with 4% to 5% glycerin and labeled with family name, date, time, locality name and collector name.

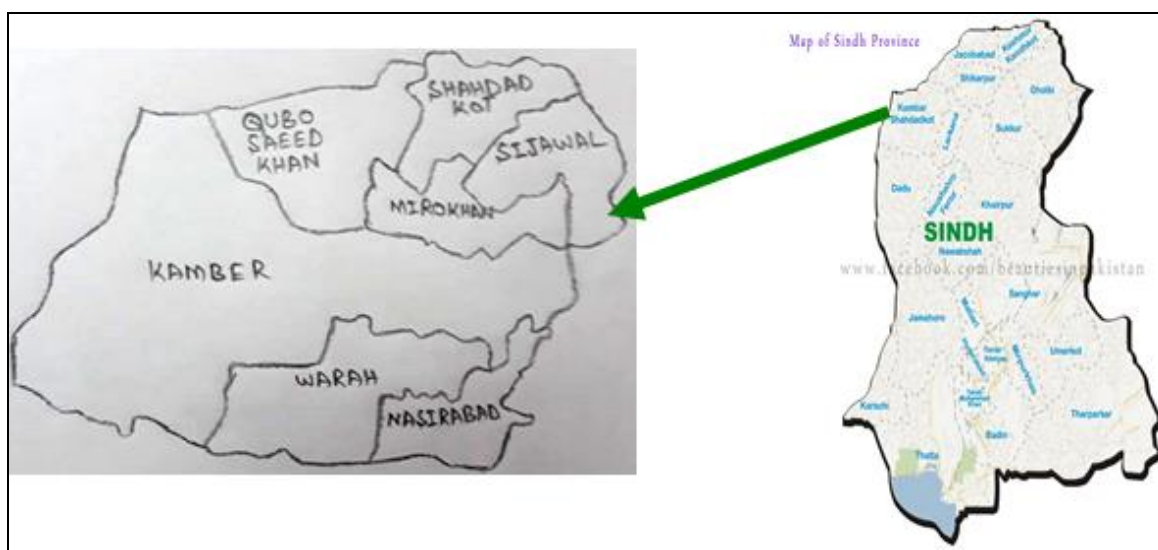


Fig 1: Map of study area



Fig 2: Different activities during the field work and laboratory work.

3. Results and Discussion

During present research project, the wheat fields of district Kamber-Shadadkot having seven localities (talukas) were visited and collected wheat spider (table no. 01). This work started from the cultivation of wheat crop in month of December up to harvestation in the month of April (figure no.03) and wheat Spiders were collected from ground, grass, foliage, leaves, stems, canals, wheat tillers and webs.

The collected 961 wheat spiders were sorted out into four families: Araneidae, Lycosidae, Teteragnathidae and Oxyopidae (figure no.04), genus and two species from family araneidae, two genera and two species from lycosidae family, genus and one species from Oxyopidae and last one is genus and one species from Teteragnathidae family (table no. 02)

The identification was based upon the morphological characters with the help of taxonomical keys [4] and literature.

During the present study the following families, genera and

species were recorded from wheat crops of seven localities (talukas) of district Kamber-Shahdadkot, Sindh, Pakistan, namely *Argiope trifasciata*, *A. Pradhani* of family Araneidae, *Lycosa terrestris*, *Pardosa birmanica* of family Lycosidae, *Oxyopes marginalis* of family Oxyopidae, *Tetragnatha javana* of family Tetragnathidae (table no. 03) but Araneidae Family is most important and key role in wheat field of this area.

Sindh province has sensibly extraordinary spider fauna. The standard research work on the systematic situation of rice spider is done from Sindh zone and also recorded 26 different species with 09 families having the 22 genera [4]. Also presented research work on the taxonomy of the spider from district Dadu in the rice field and 621 rice spiders were collected and researched out into 05 families having 06 genera with 08 species [15].

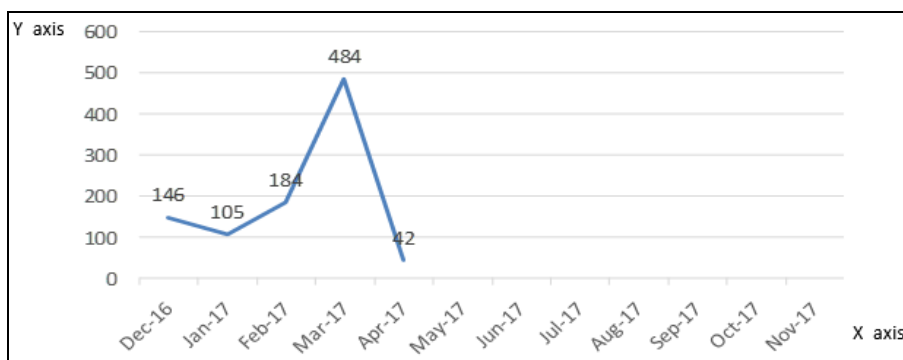


Fig 3: Monthly Status of Collected Wheat Spiders from Kamber Shadadkot

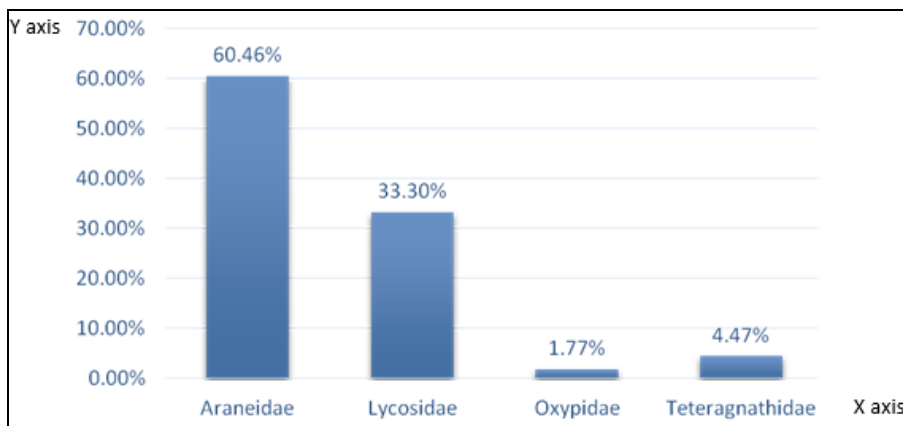


Fig 4: Status of collected Wheat Spiders at Family Level

Table 1: Status of collected Wheat Spiders at Localities Level.

Locality	Male	Female	% Of Male & Female
Kamber	32	142	18.10%
Shahdadkot	20	79	10.30%
Warah	09	45	5.61%
Nasirabad	11	65	7.90%
Mirokhan	38	247	29.65%
Sajawal	28	110	14.36%
Qubosaeed Khan	25	110	14.04%

Table 2: Diversity of wheat spiders collected from district Kamber-Shahdadkot, Sindh, Pakistan

Family	No. of genera	No. of Species	% Of Species
Araneidae	1	2	60.46
Lycosidae	2	2	33.3
Tetragnathidae	1	1	4.47
Oxyopidae	1	1	1.77

Table 3: Abundance of wheat spiders collected from wheat field of district Kamber-Shahdaskot, Sindh, Pakistan during December 2016 to April 2017.

Family Species Name	Foliage	Ground	Total
Araneidae			581
Argiope pradhani (Sinha, 1951)	442	-	442
Argiope trifasciata (Forsk., 1775)	139	-	139
Lycosidae	-		320
Lycosa terrestris (Butt, 2002)	-	158	158
Pardosa birmanica (Simon, 1884)	03	159	162
Oxyopidae Oxyopes marginalis (Mukhtar, 2004)	17	-	17
Tetragnathidae Tetragnatha Javana, (Thorell, 1890)	43	-	43
Total	644	317	961

4. Conclusion

During the systematic studies of wheat spiders from district Kamber-Shahdaskot, Sindh, Pakistan, all above species are first time recorded and all wheat spiders are identified on the basis of arrangement of eyes, tarsal claws and length of legs. This study will provide baseline data and awareness among the farmers about the wheat spider fauna of district Kamber-Shahdaskot, which will be helpful to establish and evaluate the future management practices for wheat field in this area.

5. Acknowledgment

This research is the part of the M.Phil project of the first author. I sincere grateful to my mentor, supervisor Prof. Dr. Tahira Jabeen Ursani Chairperson Department of Zoology, University of Sindh Jamshoro for her proper guidance, support and encouragement during this Challengeable research work.

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