

Checklist of spider fauna of FR Peshawar, FATA, Pakistan

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Abstract

The spiders are known as poisonous arthropods, but they also act as the predator or biological pests control agent. Their 23 species belonging to 15 genera and 09 families were reported during 2009-2010 from FR Peshawar, FATA, Pakistan. The reported families Clubionidae, Scytodidae and Sprassidae covered each 4%, Araneidae, Gnaphosidae, Pholicidae and Salticidae each 9%, Thomisidae 13% and Lycosidae 43% biodiversity of spiders of FATA. However, the largest spider collected was huntsman, *Isopoda tuhodnigra* (Barrion) with total body length 15.80 ± 0.83 mm. Moreover, the smallest spider was wolf spider, *Pardosa birmanica* (Simon) with total body length 4.20 ± 1.30 mm. Further, the crab spiders, *Thomisus pugilis* (Stoliczka), *T. spectabilis* (Doleschall) and *Diaea evanida* (Thorell) were the most colorful species belonging to family Thomisidae. A detail study is required for further exploration of spider fauna of FATA.

Keywords arthropods; biological control agent; FR Peshawar; Lycosidae; predator; spider fauna.

1 Introduction

Pakistan is an agriculture country and has very diverse fauna. Most of the areas are under the cultivation of different types of crops providing habitat for different kind of invertebrates. Among them spider is a dominant member of the community, however, in the past, less research was done on it because most of the researcher call it as a less important organism (Butt and Beg, 2001).

The spider is belonging to order Aranae, which is one of the grasping animals group (Riechert, 1984). The important characteristics of spider are the presence of carapace found on dorsal side of cephalothorax. The jaws are called chelicerae having fangs, piercing device for injecting venom. Spider produces silk through spinnerets, located on the ventral side of the abdomen. Epigynum is female reproductive organ. It is situated on the ventral side of the abdomen of the female. The trachea and book lungs are breathing organs (Nieuwenhuys, 2008). Spider always represents the hateful and injurious animal (Davey, 1994). In fact, they help us to protect crops from the pests (Fabre, 1999) as a biological control agent (Platnick, 1995). Their venom is less polluted than the pesticides used in agro-ecosystem (Novak, 2001) and testing for the treatment of heart disease (Davey, 1994).

Spider inhabits on the ground, underground tunnels systems, under stones and near water but habitually it like moist place. Some spiders live on the seaside where they are sunken into the sea twice a day. Fresh water is also the territory for many species including the water spider, *Argyroneta aquatic* (Clerck) (Karren, 2002). The growth of spider is through molting in which their size was increased with the removal of old and

hardening of new skins. The spider is varying in size and colors. The giant bird eating spider, *Theraphosid* (Thorell) size is 75 mm with leg length up to 255 mm. Female spider is larger than male (Kingsley, 1999).

The origin of spider is doubtful; however, many scientists believed that the spider originated in sea. Later on they evolved in two groups, one with and other without extensor leg muscles. The evolution of spider is around 400 million years ago. The earliest spider was larger in size and with segmented body, however, the recent spiders, almost all species are having un-segmented abdomen. Only members of the suborder Mesothelae still reported with segmented abdomen, and they are generally considered the most ancient type of spiders. There is very little record of fossil about them; however, the oldest spider fossil was found in rock, New York, USA which dating back to the Devonian period (410 to 360 million years). This fossil was preserved and only spinnerets and chelicerae were documented. From Carboniferous period (360 to 290 million years), the fossil spiders with segmented abdomen were recognized. Little information is available about spider found in Mesozoic era (240 to 65 million years). The web of spider is hardly fossilized. It is believe that early spider built unstable web near the ground, however, later on they developed aerial web in flora for catching flying insects. It is possibly to say that the evolution of spider is just related to the evolution of insects (Karren, 2002).

Little literature is available about spiders of Pakistan. Some studies on taxonomy, ecology and economic importance of the spiders from Punjab and other areas provide the importance of this little creature (Dyal, 1935; Arshad et al., 1984; Khatoon, 1985, 1986; Mushtaq and Qadir, 1999; Butt and Beg, 2001; Ghafoor and Beg, 2002; Mukhtar, 2004; Tahir, 2009). Keeping in view the importance of this group, the present study is design to prepare the checklist of spiders of FR Peshawar.

2 Materials and Methods

The Frontier Region (FR) Peshawar, FATA (Federally Administered Tribal Areas) is on the south east side of district Peshawar, Nowshera is on the north east and FR Kohat on the south of it. The spiders were collected from Asho Khel area of FR Peshawar, during 2009-10 by pitfall trap and manual hand picking, labeled and preserve in 70% alcohol with few drops of glycerin. Collected spiders were identification with the help of keys and already preserved specimen. Photography and morphometric measurements were done.

3 Results

The present research was conducted in FR Peshawar, FATA, Pakistan to explore spider fauna during 2009-2010. Their 23 species belonging to 15 genera and 9 families were reported as follows:

Phylum: Arthropoda

Sub-Phylum: Chelicerate

Class: Arachnida

Order: Araneae

Family: Clubionidae

Sac spider, *Clubiona drassodes* (Cambrige, 1874)

Family: Scytodidae

Spitting spider, *Scytodes thoracica* (Latreille, 1804)

Family: Sparassidae

Huntsman, *Isopeda tuhogniga* (Barrion, 1995)

Family: Araneidae

Garden spiders, *Araneus diadematus* (Clerck, 1757), *Neoscona theis* (Walckenaer, 1841)

Family: Gnaphosidae

Ground spiders, *Gnaphosa eucalyptus* (Ghafoor and Beg, 2002), *Scotophaeus faisalabadiensis* (Ghafoor and Beg, 2002)

Family: Pholcidae

Pholicid spider, *Artema atlanta* (Simon, 1897), Daddy long legs, *Crossopriza lyoni* (Blackwall, 1867)

Family: Salticidae

Jumping spiders, *Marpissa tigrina* (Tikedar, 1970), *Plexippus paykullii* (Audouin, 1826)

Family: Thomisidae

Crab spiders, *Diaea evanida* (Thorell, 1870), *Thomisus pugilis* (Stoliczka, 1869), *Thomisus spectabilis* (Doleschall, 1859)

Family: Lycosidae

Wolf spiders, *Arctosa littoralis* (Simon, 1897), *Hippasa partita* (Takidar, 1970), *Lycosa maculate* (Tahir, 2009), *L. species1* (Simon, 1897), *L. species* (Simon, 1897), *L. terristis* (Tahir, 2009), *L. madanensis* (Parveen, 2003), *Pardosa birmanica* (Simon, 1897), *Pardosa distincta* (Blackwall, 1867)

4 Discussion

In the present study, identification and morphometric of the spiders of FR Peshawar, FATA, Pakistan were carried out during 2009-2010. Here pointed out distinctive differences with respect to the present and available studies of the other areas carried out by different researchers.

Arshed et al. (1984) reported 18 species under 13 genera and 8 families of the spider in Peshawar district. In the present research 23 species under 17 genera and 9 families were recorded from FR Peshawar. Five species documented from the present area were more than Arshad et al. studied. The two studies showed difference in the diversity of the spider fauna. Reason was that different climatic factors in the study areas. The biodiversity and predatory efficacy of the spider in rice field was studied from central Punjab, Pakistan and recorded 44 species from a huge collection of 28000 specimens (Tahir, 2009). While the present research was a general survey reported only 9 families. Therefore, one can argue that the two studies have different biodiversity. More over the environmental factor, geographical occurrence, temperature and food availability were the factors responsible for diversity in the two studied areas.

Mukhtar (2004) surveyed the spider fauna of foliage from Punjab, Pakistan. He reported 104 species belong to 51 genera and 17 families. The most and less dominated families were Araneidae and Corinnidae, respectively. However, the present study was a general survey and only 9 families came under study, in which Lycosidae was the largest family with nine, while Clubionidae, Scytodidae and Sparassidae are the smallest family with only one species. Therefore, one can argue that the diversity differences were due to habitat differences and also geographical situation of both areas were different. The present study area was more toward the North Pole and away from equator. The climatic condition of the present study area was little colder than Punjab, Pakistan.

Ursani and Soomro (2010) studied and updated the checklist of the spider fauna in Sindh province, Pakistan. A total 132 species were recorded belong to 24 families and 73 genera from 16 surveyed districts. Majority of reported species were earlier defined except family Zodariidae first time recorded from Pakistan. In the present research, 23 species were reported from FR Peshawar, FATA, Pakistan. All reported species were earlier defined. The diversity difference among the two study areas was due to geographical and ecological differences. As insects are the main source of food for spider and they are abundant in the warm areas, therefore, the diversity was different among the two study areas. A detail study is required for further

exploration of spider fauna to enhance more biodiversity of spiders with reference to the taxonomy, physiology and ecology.

5 Conclusion

In the present study, a total 23 species belonging 17 genera and 9 families were reported from FR Peshawar, FATA, Pakistan during 2009-2010. Among the families, Lycosidae contained the highest number of species collected; however, Sparassidae is the smallest family contained only one but the largest species. The families were Clubionidae, Scytodidae and Sprassidae each with 1 species, Araneidae, Gnaphosidae, Pholicidae and Salticidae each with 2 species, Thomisidae with 3 species and Lycosidae with 9 species. Most of them were ground spiders, Lycosidae was the largest family and Clubionidae, Scytodidae and Sparassidae was smallest families during this study.

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