The Research of Medical Science Review
ISSN: 3007-1208 & 3007-1216 Volume 3, Issue 5, 2025

CHECKLIST OF SPIDER FAUNA (ARACHNIDA: ARANEAE) IN THE BANANA FIELDS OF DISTRICT MATIARI, SINDH, PAKISTAN

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DOI: https://doi.org/10.5281/zenodo.15395279

Keywords
Spider fauna; Aranae; Banana fields; Matiari; Sindh.

Article History
Received on 05 April 2025
Accepted on 05 May 2025
Published on 13 May 2025

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Abstract

There is an contiguous requisite to investigate Pakistan's spider fauna, documented and conserve spiders due to their diverse predatory efficiencies and great medical importance. Role in formation of food web also participation in IPM, the current study focused on exploring new habitats of this valuable arthropods and the to give the checklist. The Banana is the major cash crop of Pakistan particularly from Sindh Province. District Matiari is famous for banana fields. About 80% banana production contributed by Sindh province and from Sindh about 40% banana produced by District Matiari. Consequently, the current research is focused on the spider fauna above mentioned site with the aim of distinguishing and developing a checklist of spiders. Diversity of spiders fauna was measured very rich in the District Matiari; due to its favorite climatic and abiotic (temperature and humidity) conditions.for the collection of spiders specimens banana fields were selected, surveyed during 2021- 2022. The findings showed that 992 specimens were collected, which sorted out into 13 species, and 09 genera and 6 families.

INTRODUCTION

Taxon Arthropod is the largest phylum of kingdom Animalia beside insects; spiders have important ecological status due to their versatile diversity and habitat variations. The first are the often pest and second are the predators. Spider are efficient predators whose role has been unattended in the research. Spiders make the largest group of carnivorous, order Aranae ranked seventh on the basis diversity. The body of spider is divided into two parts i.e cephalothorax and abdomen. For the capturing of the prey spider have a pointed appendages called chelicerae, eyes arrangement is unique characteristic of spider, a tool for identification and classification. Spiders have been reported as biological control agents in various agricultural fields [1,2]. Several studies indicate that vegetation structures influence the abundance of spider [3,4,5] Banana is the one of the major cash crop of Pakistan. Banana (*Musa paradidica* L.) belongs to the banana family Musaceae. A banana is an edible fruit produced by various kinds of this herbaceous flowering plants in the genus Musa. The fruit is versatile in size and color with soft flesh rich in starch, iron and many essential vitamins [6]. The fruits grow in clusters hanging from the top of the plant. Bananas are an excellent source of vitamin B6, soluble fiber, and contain moderate amounts of vitamin C, manganese and potassium [7]. Along with other fruits and vegetables, consumption of bananas may be associated with a reduced risk of cancer and in women, breast cancer and renal cell carcinoma. Banana ingestion may affect dopamine production in

people deficient in the amino acid tyrosine, a dopamine precursor present in bananas. Individuals with a latex allergy may experience a reaction to bananas [8]. Banana is a major fruit crop of Pakistan. It is grown on 34,800 hectares with production of 154,800 tons [9]. The co-occurrence of spider with banana is vital for natural pest control, because man made pesticides are difficult to apply due to two reason one plants are large to spray and other is dangerous for mankind to used [10]. Many schoalrs give a significance finding to the science related to agriculture fields such as wheat, rice, cotton etc. has been explored by [6,7,8,9,10]. Several authors from Asia worked on Spiders and contribute a lot in the exploring of spider fauna [12, 13,14,15,16,17]. The majority work done in Punjab and from Sindh, but this is the first time in Sindh to explore the spider fauna of banana fields occurring in the district Matiari. The spiders of medical importance in the Asia and Pacific regions include widow (family Theridiidae) and Australian funnel-web spiders (subfamily Atracinae). In addition, cupboard (family Theridiidae) and Australian mouse spiders (family Actinopodidae) may contain neurotoxins responsible for serious systemic envenomation. Luckily, there appears to be extensive cross-reactivity of species-specific widow spider antivenom within the family Theridiidae. Moreover, Sydney funnel-web antivenom has been shown to be effective in the treatment of mouse spider envenomation. Some species of the genera Latrodectus, Loxosceles, Phoneutria (infraorder Araneomorphae) and Atrax/Hadronyche (infraorder Mygalomorphae) which are responsible for severe envenoming in humans, often requiring antivenom treatment. While a few species that produce a venom often only use this in small dosis for defense. However, the presence of spiders triggers psychological reactions in many people. Spiders in supermarkets always cause panic, especially when they are found in fruit displays, particularly between bananas. The name "banana spiders" does not refer to a specific species but only to the location where they are found. They belong to different species and families depending on the origin of the bananas which are produced in (sub)tropical areas of Africa and Latin America [18-20].

MATERIALS AND METHODS:

Study area

Collection of Spiders was made from three talukas (Table.1) District Matiari (026°28'13.3"N and 83°38'28.3"E) where their were banana fields cultivated. Study period was 2021 and 2022 (Map.1).

Collection and Preservation

Pitfall method and hand picking methods were used for the collection. Fields were visited every month. Collected material preserved in 70% alcohol, for identification, morphological attribute were considered with related literature and taxonomical keys were used.

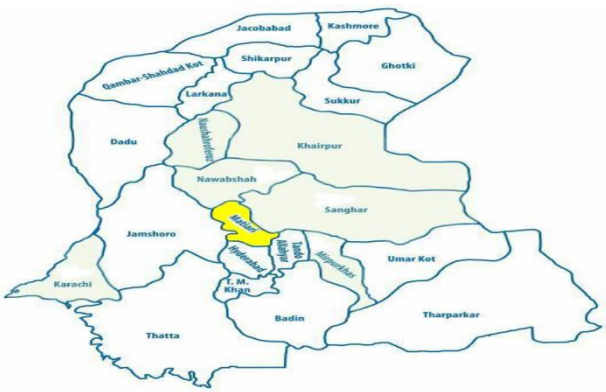
Total collection

992 specimen (including spiderlings) were gathered. Keys followed; for the identifications of spiders were used [1,2,3,4]. Specimens brought to laboratory for the analysis.

RESULTS:

The present study is based on the spider fauna of one district of Sindh, Province, namely Matiari and for collection Banana fields were selected. Research was conducted during 2021- 2022 (table.1). And 992 specimens, 13 species and 06 genera of 06 families were identified (Table.2 &3). Pakistan is rich in spider fauna and has diverse habitats [1,2] Spiders are ancient and successful group of invertebrates and known as poisonous arthropods [3, 10,11]. This quality makes them the most suitable potential bio-control agents for regulating the population of insect pests in different agro-ecosystems and requires their extensive study. Spiders are one the most important group of biological predators in nature. They are eight legged Arthropods and largest order Araneae of the Class Arachnida. They are ranked at the seventh number in the biodiversity [12]. Throughout in the world as by the August 2022, 50,356 species of spiders have been identified with 132 families and many archeologists' works on the diverse aspects of spiders [13-24]. Banana (Musa paradidica L.) plant has been fit in to family Musaceae, it is major fruit grown in Sindh, Pakistan. All the abiotic and climatic conditions favor the growth of banana crops in the Sindh. Hence it is cultivated in thousands of hectares. Banana crops are infected by the numbers of the pests, such as banana aphids, weevils, coconut scale, thrips

and Nematodes. The farmer of Sindh, Pakistan generally uses chemical pesticides to protect their crops which have many hazardous affects on the climate as well as on man [25-27]. For the chemicals, the best alternate is the biological control, which refers to the use of natural enemies against the pest population to reduce the pest's density. It is one of the safe methods to control the pests because it is not toxic, pathogenic and injurious to human beings Biological control has the advantage of being self established and usually does not harm non-targeted organisms in the environment. It is regarded as safe and never polluting, nor does it leave residues on food, a concern to many people today. Recent many developments have been preceded in favor of bio control as spiders are the potential biological control agents. Most of spiders are generalist predators. They were not historically considered useful bio-control agents against agricultural pests, because they feed both on harmful as well as beneficial insects. However, studies have indicated that spiders can, help suppress pest populations. Spiders are abundant and widespread in almost all ecosystems and constitute one of the most important components of global biodiversity. Spiders have a very significant role to play in ecology by being exclusively predatory and there by maintaining ecological equilibrium. It is estimated that the world's 25 million tons of spiders kill 400–800 million tons of prey per year. Most of the spiders are generalist predators feed mainly on phytophagous as well as predaceous insects. Being predatory in nature spiders are very important for the studies concerning the biological control. Only Samina Malik which pioneer description on guild structure from sugar-cane crop present. Information available about the species of spider's guild structure and biodiversity in Pakistan and their distribution are scientifically quite limited as compared to the world knowledge. Biology, ecology, taxonomy, diversity of spiders and guild structure of spiders found in banana crops are particularly limited. No proper and detailed research work has been done on the biodiversity and Guild structure of spiders from different localities of districts Hyderabad, Shaheed Benazir Abad, Mirpurkhas and Matiyari. Only special reference S. Malik given detail of guild structure of spider from district Tando Jam and sugar crops from Matiyari. It is aimed to this study to present and detail guild structure from another crop of banana from selected areas of Sindh. Present study will provide baseline data about the Banana spider fauna of district Matiyari, which will be helpful to establish and evaluate the future management practices for banana crops as well as any another field.



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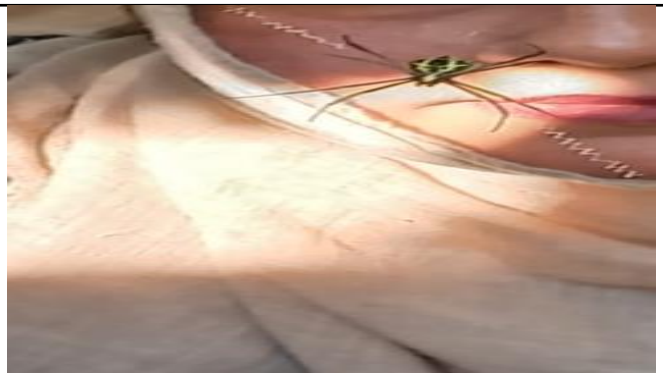

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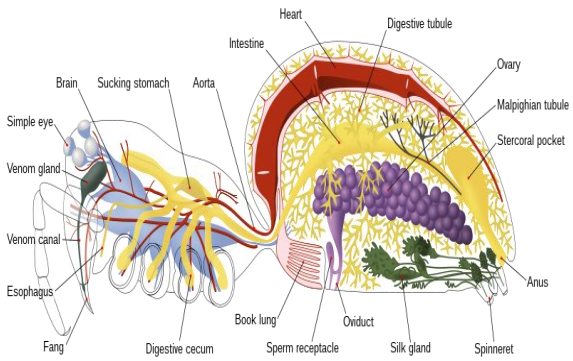

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Taluka of Matiari	Frequency	%
Matiari	458	46.16
Hala	330	33.26
New Saeedabad	204	20.56
03 sites	992	100

7

8

Explanation to figures.
Figure.1 the map of Sindh, showing in the centrally located District Matiari highlighted in yellow color. **Figure.2-4,** different sites in the banana plantation; showing the pitfall trap method for the collection of spiders. **Figure.5** anatomy of spider **Figure.6 viols and collection of spider** in the year 2021 and 2022, Figure 6 table showing frequency and percentage of collection. Figure 8 showing the a spider species on the banana filed.

Table 1. Total no: of families, genera and species collected from Banana fields, Matiari Year 2021 to 2022

FAMILIES	GENERA	SPECIES
06	09	13

Table 2. List of spider families with genus, species and their micro habitat in banana fields.

FAMILY	GENUS	SPECIES	Micro habitat in Banana
Araneidae	Neoscona Argiope	Neoscona theisi N. rumfi N. javedensis* Argiope anasuja A. trifasciata	Found upon sunny areas resting on web between two banana plants, and in grasses, vegetation near by. While a few between leaves, petioles and pseudostems of banana.
Total	**02**	**05**	
Lycosidae	Lycosa Pardosa	Lycosa maculate L. vulgaris Pardosa birmanica	On the ground, among the mulch, in leaf litter, in ground crevices, in the banana
Total	**02**	**03**	
Oxyopidae	Oxyopes	Oxyopes marginalis	On the foliage of banana
Total	**01**	**01**	
Tetragnathidae	Tetragnatha	Tetragnatha javana	On the foliage of banana
Total	**01**	**01**	
Salticidae	Phidippus Plexipus	Phidippus sindhica P. bengalensis	On the ground, among the mulch, in leaf litter, in ground crevices, in the banana
Total	**02**	**02**	
Gnaphosidae	Gnaphosa	Gnaphosa poonaensis	Spaces between banana flower bracts, tiers and fingers of bunches or on upper parts of banana

* Neoscona javedensis first time reported*

Table 3. The checklist of spider fauna recorded from Banana fields

1. Family Araneidae Simon, 1895 (i) **Genus** Neoscona Simon,1895 1. Neoscona theisi Thorell,1895 2. N. rumpfi Thorell, 1878 3. N. javedensis Tahira, 2014 (ii) **Genus** Argiope Audouin, 1826 1. Argiope anasuja Thorell, 1887 2. Argiope. trifasciata Forskal,1775	**2.Family Lycosidae Sundevall, 1833** (i) **Genus** Lycosa Latreille, 1904 1. Lycosa maculata Mello-Leitao, 1943 2. Lycosa vulgaris Koch, 1838 (ii) **Genus** Pardosa Koch, 1848 1. Pardosa birmanica Simon,1884
3.Family Oxyopidae Thorell, 1870 (i)Genus Oxyopes Latreille, 1804 1. Oxyopes marginalis Mukhtiar, 2004	4.Family Tetragnathidae **Anton Menge, 1866** (i)Tetragnatha Latreille, 1804 1. Tetragnatha javana Thorell, 1890
5.Family Salticidae Blackwell, 1884 (i) Genus Phidippus Koch, 1846 1.Phidippus sindhica Tahira, 2014 (ii)Genus Plexipus Koch, 1846	6. Family Gnaphosidae Simon, 1897 (i) Genus Gnaphosa Latreille, 1804 1. Gnaphosa poonaensis Tikader 1973

2. Plexipus bengalensis Tikader, 1973	

Table 4. Families, their Identification key characters occurring in the and familiar characteristics.

Araneidae (Stalkers & Orb weavers) 8 similar eyes; spiny, long legs; with 3 claws; chelicerae not strong; femur IV provided with a double fringe of hairs on the prolateral surface; vertical orb-web builders.	**Lycosidae** (wolf spiders & ground runners) Resemble nursery web spiders and do not spin webs; 8 eyes arranged in three rows; The middle row has 2 very large eyes. Some members of this make deep tubular burrows.
Oxyopidae (lynx spiders) Make little use of webs; have large spiny bristles on their legs Small to medium in body size, 8 eyes, six of them are arranged in hexagonal pattern, other two eyes are smaller; basal part of chelicerae of most oxyopids is large, vertical and parallel; chelicerae with single tooth..	**Teteragnathidae** (Orb weavers & long jawed); legs and chelicerae elongated; endites elongated and widest at distal edge; Legs very long; Homogenous eyes.
Salticidae (jumping spider); have some of the best vision among arthropods and use it in courtship, hunting, and navigation; known by four pairs of eyes pattern.	**Gnaphosidae** (ground spiders) Generally, ground spiders are characterized by having barrel-shaped anterior spinnerets that are one spinneret diameter apart

ACKNOWLEDGMENTS

We are grateful to Dr. Jawaid Ahmed Khokhar , Assistant Professor, Department of Zoology, University of Sindh for going through the manuscript and giving valuable suggestions.

CONFLICT OF INTEREST

All authors have declared that there is no conflict of interest regarding publication of this article.

REFERENCES

[1] Ursani, T.J., Soomro, A.R., Dhiloo, K.H., Soomro, N.M. and Solangi, A.W., 2013. ARGIOPE BILALI, A NEW SPECIES OF (ARANEIDAE, ARACHNIDA) BUGS FORM DISTRICT DADU, SINDH.

[2] SOOMRO, A.R., URSANI, T.J., DHILOO, K.H., MALIK, S., KHOKHAR, J.A. and CHANDIO, J.I., Description of newly identified spider Eusparassus naheedae (Family: Sparassidae; Order: Araneae) on rice crop at K. N Shah District Dadu, Sindh-Pakistan.

[3] Coddington, J.A., 2005. Phylogeny and classification of spiders. Spiders of North America: an identification manual.

[4] Maddison, W.P., 2015. A phylogenetic classification of jumping spiders (Araneae: Salticidae). Journal of Arachnology, pp.231-292.

[5] Russell-Smith, A. and Stork, N.E., 1994. Abundance and diversity of spiders from the canopy of tropical rainforests with particular reference to Sulawesi, Indonesia. Journal of Tropical Ecology, 10(4), pp.545-558.

[6] Memon, I.N., Wagan, H., Noonari, S., Lakhio, M.H. and Lanjar, B.A., 2016. Economic analysis of banana production under contract farming in Sindh Pakistan. Economic Analysis, 21, pp.14-21.

[7] Waseem, R., Mwalupaso, G.E., Waseem, F., Khan, H., Panhwar, G.M. and Shi, Y., 2020. Adoption of sustainable agriculture practices in banana farm production: A study from the Sindh Region of Pakistan. International Journal of Environmental Research and Public Health, 17(10), p.3714.

[8] Ali, K., Hyder, M.Z., Muhammad, A., Hussain, I., Faqir, N., Shahid, M.M. and Ali, G.M., 2017, September. Banana industry of Pakistan: opportunities and challenges. In I International Conference and X National Horticultural Science Congress of Iran (IrHC2017) 1315 (pp. 179-184).

[9] Irfana Noor, M., Sanaullah, N. and Barkat Ali, L., 2015. Economic efficiency of banana production under contract farming in Sindh Pakistan. J Glob Econ, 3(166), p.2.

[10] Muhammad, A., Hussain, I., Ali, K., Zeshan, M., Ali, S., Soomro, N.A., Kaloi, G.M., Faqir, N., Hyder, M.Z., Sarwar, S. and Shahid, M.M., 2020. Physicochemical, yield potential and sensory evaluation of banana cultivars introduced in Pakistan. Pakistan Journal of Agricultural Sciences, 57(6).

[11] Marusik, Y.M. and Koponen, S., 2002. Diversity of spiders in boreal and arctic zones. The Journal of Arachnology, 30(2), pp.205-210.

[12] Uetz, G.W., Halaj, J. and Cady, A.B., 1999. Guild structure of spiders in major crops. Journal of Arachnology, pp.270-280.

[8] Malik, S., Ursani, T.J., Khokhar, J.A. and Soomro, A.R., 2018. Spider guilds in the sugarcane fields of two districts of Sindh, Pakistan. Int J Zool, 3, pp.8-11.

[13] Malik, S., Ursani, T.J., Soomro, N.M., Narejo, N.T., Khokhar, J.A. and Soomro, A., 2022. Feeding and circadian behaviour of spiders (Aranae: Arachnida) in the sugarcane fields of Matiari and Hyderabad Districts, Sindh. Journal of Innovative Sciences, 8(1), pp.75-79.

[14] Butt, A. and M. A. Beg. 2000. Some new species of Marpissa (Salticidae) from Pakistan. Pak. J. Zool., 32: 75-79.

[15] Butt, A. and M. A. Beg. 2001. Description of two new species of spiders of the families Clubionidae and Oxyopidae from Pakistan. Pak. J. Zool., 33: 35-37.

[16] Riechert, S.E. and Lockley, T., 1984. Spiders as biological control agents. Annual review of entomology, 29(1), pp.299-320.

[16] Ndava, J., Llera, S.D. and Manyanga, P., 2018. The future of mosquito control: The role of spiders as biological control agents: A review. International journal of Mosquito research, 5(1), pp.6-11.

[17] Michalko, R., Pekár, S. and Entling, M.H., 2019. An updated perspective on spiders as generalist predators in biological control. Oecologia, 189, pp.21-36.

[18] Hodge, M.A., 1999. The implications of intraguild predation for the role of spiders in biological control. Journal of Arachnology, pp.351-362.

[19] Tikader, B. K. 1982. The Fauna of India: Araneae: Araneidae. Zool. Surv. India, 2: 1-293.

[20] Biswas, B. and K. Biswas. 2003. Fauna of Sikkim (Araneae: Spiders), State Fauna Series, 9:67-100.

[21] Nicholson, G.M. and Graudins, A., 2002. Spiders of medical importance in the Asia–Pacific: Atracotoxin, latrotoxin and related spider neurotoxins. Clinical and experimental pharmacology and physiology, 29(9), pp.785-794.

[22] Lucas, S.M. and Meier, J., 2017. Biology and distribution of spiders of medical importance. In Handbook of clinical toxicology of animal venoms and poisons (pp. 239-258). CRC Press.

[23] Pospischil, R.E.I.N.E.R., 2011. Medical importance of introduced spiders. DGaaE-Nachrichten, 25, pp.30-31.