
Description of newly identified spider *Eusparassus naheedae* (Family: Sparassidae; Order: Araneae) on rice crop at K. N Shah District Dadu, Sindh-Pakistan

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Abstract:

Spiders are carnivorous and one of the most active predatory in nature feeds insects, pest and other arthropods in terrestrial ecosystem. The study on survey and identification of a newly found spider species was carried out at District Dadu-Sindh. The newly found spider species of genus Eusparassus of Sparassidae Family was recorded first time and named as Eusparassus naheedae.

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Key words: Spider, Arthropods, Identification. Sparassidae, *Eusparassus naheedae*

INTRODUCTION

Economically Pakistan is considered a third world country for cultivating cash crops. Of these cash crops, rice crop is considered to be major crop and plays pivotal role in the agricultural industry. Rice is infested with several insect pests such as, stem borers, leaf folders, and white-backed plant hoppers, and cause 25-30% yield losses (Hashmi 1994). Farmers use pesticides to minimize the pest problems but their sustained application has deleterious effects on an environment and human health (Devine et al. 2007). To control agricultural pests, use of natural predators is admirable recently. Spiders are polyphagous feeding on many various insect pests and are known as macro invertebrate predators in agro-ecosystems (Marc et al. 1999; Nyffeler and Sunderland 2003; Pearce and Zalucki 2006; Schmidt et al. 2004). Rice crop is also found with a wide range of predatory spiders which control the pest population (Xu et al. 1987). Spiders have reduced a pest population equal to insecticides into rice fields (Xu et al. 1987; Jalaluddin et al. 2000). Sindh province of Pakistan is richly cultivated in cash crops like rice and heavily infested with insect pests causing 25-30% losses in production (Butt 1996; Hashmi 1994). Though several natural predators like spiders have been used to overcome agricultural pest problems (Sunderland, K. and Samu, F., 2000). But unfortunately, such significant and useful natural biological control group has been neglected in Sindh, Pakistan due to lack of taxonomic knowledge of spider fauna except a few (Ursani et al. 2010, 2013). Some of the huntsman spiders of genus *Eusparassus* have been represented by (Simon 1903; Dyal 1935).

In the light of above discussion, researchers need to get involved themselves in interest to use spiders as biological control agents in rice ecosystem, bring awareness towards the farmers the importance of spiders and need to have comprehensive knowledge of spiders in a particular agriculture system. No one attention has been given to known about the spider fauna of rice crop in district Dadu. Herein we identified *Eusparassus* genus of Sparassidae spider family from one of the rice belt area K.N Shah, District Dadu of Sindh-Pakistan. This study will provide base line taxonomic information necessary to start a spider-based Integrated Pest Management program in Pakistan.

MATERIALS AND METHODS

The study on newly identified species of spider fauna was carried out in one of the rice grown area called K.N Shah in District Dadu of Sindh-Pakistan during two consecutive seasons of 2013 and 2014. Regular survey was carried out to find out the spiders present in rice fields around the District Dadu. A pitfall trap was constructed by digging a hole with a trowel in the ground and placing can into the hole with the lip of the can level with the soil. For recording the population of aerial spider's hand picking method was used and for ground dwelling spiders 50 pit fall traps were placed randomly in each rice field. Pitfalls consist of cups/cans with preservative (70% alcohol) in the bottom. The trap was weekly checked for specimens, the numbers of spiders were counted throughout the season. The collected material was then brought to laboratory in film- canisters/jars having 70% alcohols. The specimens were thoroughly examined under Stereoscope dissecting binocular microscope. Identification of specimens was done. During survey holo type 1♀, 09 VIII-2014, was collected from K.N. Shah, District Dadu of province Sindh (Fig. 1).

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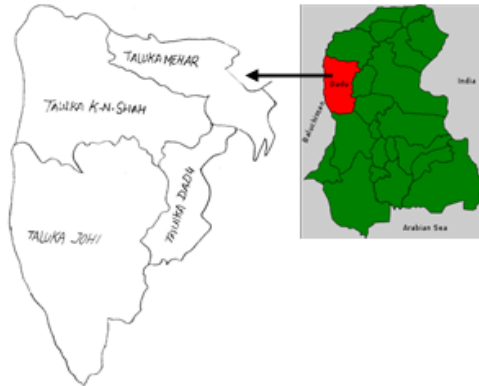


Figure 1.Site of investigation of spider of rice crop in District Dadu Sindh

RESULT

During the present study, the rice fields of district Dadu-Sindh were surveyed for the collection of Spiders not only from the rice crops but also from grasses, under stones, tunnels in the ground, sandy soils, near water pools, canals, foliage, rice tillers around the web architecture (viz., height of hub above ground, web capture area, mesh size, number of spirals and number of radii) according to standard collection methods and were then prepared for laboratory examination. In the present study the new recorded *E. naheedae* of family Sparassidae was identified from Taluka K.N Shah of District Dadu.

FAMILY SPARASSIDAE BERTKAU, 1872

(Huntsman or Giant Crab Spiders)

DIAGNOSIS: Earthy brown and gray, size large, carapace longer than wide, fovea longitudinal; sternum pentagonal, blunt to acuminate posteriorly; eyes 4 pairs in 2 rows, recurved in Heteropoda variable in other genera; chelicerae with both fang

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margins toothed, legs Laterigrade, metatarsus with membranous trilobed dorsoapical extension, tarsi may hyperextend dorsal of metatarsal axis, tarsi with 2 claws, claw tuft and scapulae; abdomen longer than wide, somewhat dorso-ventrally flattened; spinnerets 3 pairs conical, contiguous, colulus present only in *Pseudosparianthis* ; genitalia entelegyne, female epigynum with anteriorly bordered atrium, male palpus with large RTA, bifid in heteropodinae genera, simple in *Pseudosparianthis*.

GENUS *EUSPARASSUS* SIMON, 1903

1903. *Eusparassus*: Simon, Hist. Nat.Araign.I:1025

1935. *Eusparassus*: Dyal. Bull. Zool. Punjab Univ. 1:205-206.

DIAGNOSIS: Cephalothorax convex, usually not longer than broad ; anterior eyes not very large, spaced equally from one another, median larger than laterals; labium as broad as; inferior margin of chelicerae with teeth ; clypeus low each anterior tibia with two spines only.

DISTRIBUTION: Central Asia.

***EUSPARASSUS NAHEEDAE* N.SP**

DIAGNOSIS: *Eusparassus naheedae* species is closely related to *Eusparassus dufouri* (Simon) except vulva epigynae with two large parallel U-shaped lateral lobes, median septum (MS) sclerotized and hard, internal duct system situated in a depression with glandular pores.

DESCRIPTION OF FEMALE HOLOTYPE: Cephalothorax, and Legs orange brown in color, carapace wider than long, narrowing in front, covered with pubescence; ocular area with golden, thoracic groove deep, dark brown. Anterior rows of eyes curled, equidistant, AME larger than ALE. Posterior rows of

eyes straight, PME smaller and closer to PLE; base of each encircled by black ring. Clypeus narrow, Chelicerae strong, black brownish in color, Chelicerae furrow with denticles, promargin with two teeth, retromargin with five unequal teeth covered with dense hairs labium wide and long as wide pale yellow. Sternum oval and clothed with pubescence. Legs laterigrade, banded with hairs and long spines; Leg II longer than others, metatarsi and tarsi of all legs are thickly scopulated. Leg formula: 2413.

ABDOMEN: Abdomen longer than wide, pale, entire dorsum constricted with deep patches covered with bristles and hairs, ventral area concolour as dorsal side. Eepigyne consisting of two large parallel triangular lateral lobes (LL) median septum (MS) hard and sclerotized, EF fusing at anterior and forming the bridge. Copulatory opening (CO) paired. Vulva with copulatory duct (CD) long and sac like, fertilization duct (FD) truncated observed. Both habitats Ground and Foliage were present and it is observed that the new species hunts the pest of rice crops in ecological aspects the Sparassidae family diverse in guild composition and behavioral aspect.

MALE: unknown

MATERIAL EXAMINED: Holotype 1♀, 09 VIII-2014, at K.N. Shah District Dadu (Asif Raza) of Scientific Research at Department of Zoology, University of Sindh, Jamshoro, Sindh-Pakistan.

REPOSITORY: The type material is deposited in the Advanced Entomology Laboratory, Department of Zoology, University of Sindh, Pakistan.

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MALE: unknown

MATERIAL EXAMINED: Holotype 1♀, 09 VIII-2014, and K.N. Shah by (Asif Raza).

ETYMOLOGY: This new species is named in the honor of Professor Dr. Naheed Soomro, my supervisor for her great contribution to promote of Scientific Research at Department of Zoology, University of Sindh, Jamshoro.

REPOSITORY: The type material is deposited in the Advanced Entomology Laboratory, Department of Zoology, University of Sindh, Jamshoro, Sindh-Pakistan.

Table-1 MEASUREMENTS: 1♀ (mm)

PARAMETERS	HOLOTYPE (n=1)
Body Length	23
Carapace Length	10
Carapace Width	9
Abdomen Length	13
Abdomen Width	9

Table-2 MEASUREMENTS OF LEGS (mm)

Legs	I	II	III	IV
Femur	12	13	11	13
Patella + Tibia	14	15	12	14
Metatarsus	11	12	9	11
Tarsus	1.2	1.2	1.3	1.5
Total	38.2	41.2	33.3	39.5



Figure 2. (a-b) Dorsal, and ventral, view of *Eusparassus naheedae* n.sp



Figure 3. (c-d) c. *Eusparassus naheedae* eyes d. Cheliceral teeth *Eusparassus naheedae* n.sp

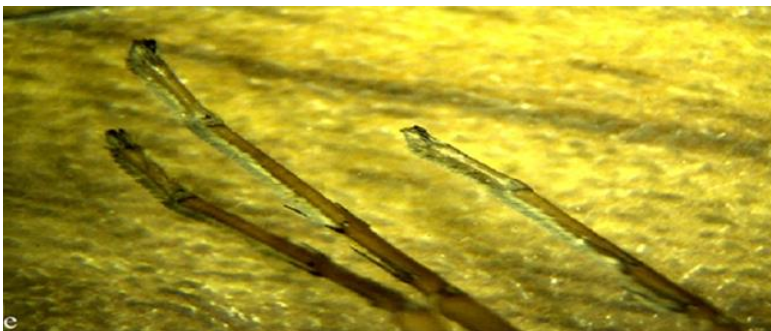


Figure 4. (e) Leg tarsi and metatarsi thickly scopulated *Eusparassus naheedae* n.sp

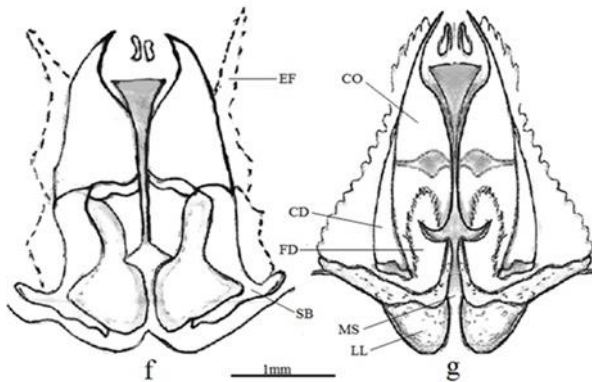


Figure 5. *Eusparassus naheedae* n.sp (f) epigyne, ventral; (g) vulva, dorsal; CD, copulatory duct; CO, copulatory opening; EF, epigynal field; FD, fertilization duct; LL, lateral lobes; MS, median septum. Scale bars: (f, g) 1 mm.

DISCUSSION

In Asia, spiders are the most important predatory group in rice field. According to report, one wolf spider can eat up to 45 hoppers a day (IRRI 2000). Moreover, in tropical rice paddies, wolf spiders reduced densities of sucking herbivores (Cicadellidae and Delphacidae) (Fagan et al. 1998; Ishijima et al. 2006). Several studies have shown that insect populations significantly increase when released from predation by spiders. Unfortunately, such significant and useful natural biological control agents have been neglected in Pakistan. Ghafoor (2002) has reported the taxonomic study from June through December in 1993, on NIAB-78 variety of cotton and recorded eight families and 64 species of spiders. However, in Pakistan few studies have been conducted and most often limited to the identification and some basic ecological information about spider species. Rudimentary studies are carried out by various Asian scientists: (Dyal 1935; Tikader 1980; Tikader and Biswas 1981; Barrion and Litsinger 1995; Tikader 1982; Mushtaq and Qadar 1999; Butt and Beg 1996; Butt and Beg 2000; Butt and

Beg 2001; Jalaluddin et al. 2000; Butt and Siraj 2006; Ursani 2010 & 2013). Limited information about the population dynamics and functional role of spider in agricultural fields of Pakistan is available. Only work in this regard has been done by (Tahir and Butt 2008 & 2009) in rice fields at central Punjab-Pakistan. Yan et al. (1997) reported 373 species, 109 genera and 23 families of spider have been identified in rice fields of China. Sindh-Pakistan has a moderately diverse spider fauna. The only work done in Sindh province is by Rajput et al. (2012) he recorded 26 species in 22 genera belonging to 9 families. In the present study we surveyed different areas of District Dadu and identified a new *Eusparassus* genus of Sparassidae Family and named as *Eusparassus naheedae*.

CONCLUSION

The present study concluded that a new spider species was identified first time K.N Shah of District Dadu Sindh-Pakistan. The identified species is specific to *Eusparassus* genus of Sparassidae Family and named as *Eusparassus naheedae*.

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Conflict of interest declaration: The authors have declared that no conflicts of interests exist.

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