



## RESEARCH PAPER

## OPEN ACCESS

## New record of spiders fauna of Khyber Pakhtunkhwa Province, (Aranei; Sparassidae; Pholcidae) Pakistan

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### Abstract

Present study was conducted from 2014 to 2015 in different regions of North Western parts of for Khyber Pakhtunkhwa adjacent Tribals areas (FATA) of Pakistan to explore the biodiversity of spiders (Araneae: Arachnida) in this part of the country. Our findings are introduction of new fauna to Pakistan. Spiders Samplings were conducted by hand picking sweep nets and pitfall during different periods of year mostly April to October of 2014 and 2015. The specimens were analyzed under stereomicroscope and compound microscope, while genitalia were removed and draw or taken picture for comparing to exact identification. The family sparassidae and Pholcidae (Araneae: Arachnida) although have reported fauna but Species *Cross oprizamaculipes* (Spassky, 1934) and *Oliosanguinifrons* (Simon 1906) are first time recorded in Pakistan, as previously reported from adjacent countries India, Afghanistan and Turkmenistan. Our study will impel taxonomist to future Taxonomical work can multiply our unknown biodiversity of arenas.

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## Introduction

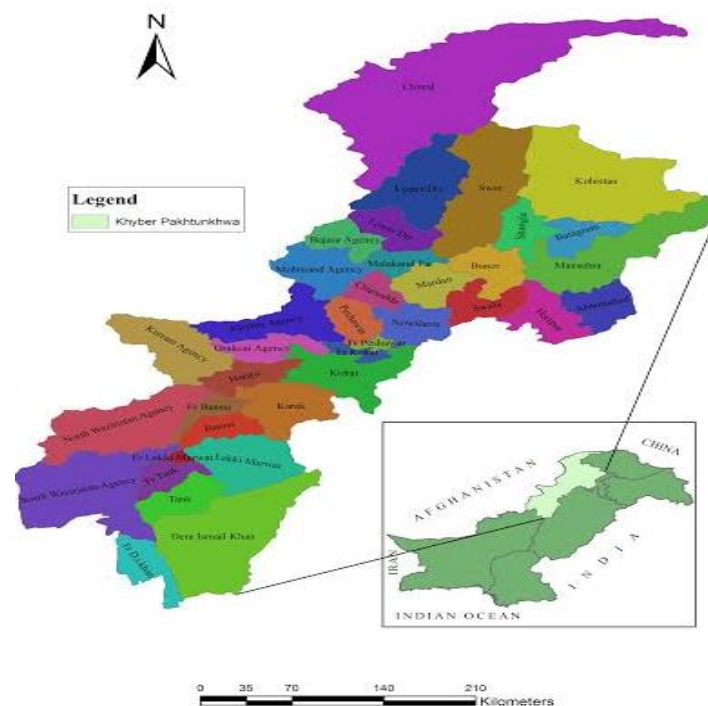
The order Araneae of class Arachnida found in all type habitat ecosystems. These are eight legs arthropods being extensively predatory in ecosystem. They have great biodiversity in groups and one of the frequent growing field and getting more attention due to more exploring work and adding new to science spiders. Presently there are 114 families, 3988 genera and more than 46000 species of spiders worldwide (World Spider Catalog, 2016).

The spiders of Pakistan have been treated less for exploration than subjected to ecological or applied. The checklist of Siliwal and Molur, (2007) reports 138 species from Pakistan. Western adjacent country Iran have 46 families 239 genera and 562 species which 2 times more than Pakistan (Zamani. *et al.*, 2016). The checklist of araneae from represent 60 families 438 genera and 1686 species up to 2012 (Keswani *et al.*, 2013). Only fauna of *Salticidae* (Araneae: Salticidae) of Afghanistan shows more fauna than Pakistan, while rest araneae also have more numbers. (Logunov, 2005), Although work in South Eastern part of Pakistan by Butt and Beg, (2000), Butt and

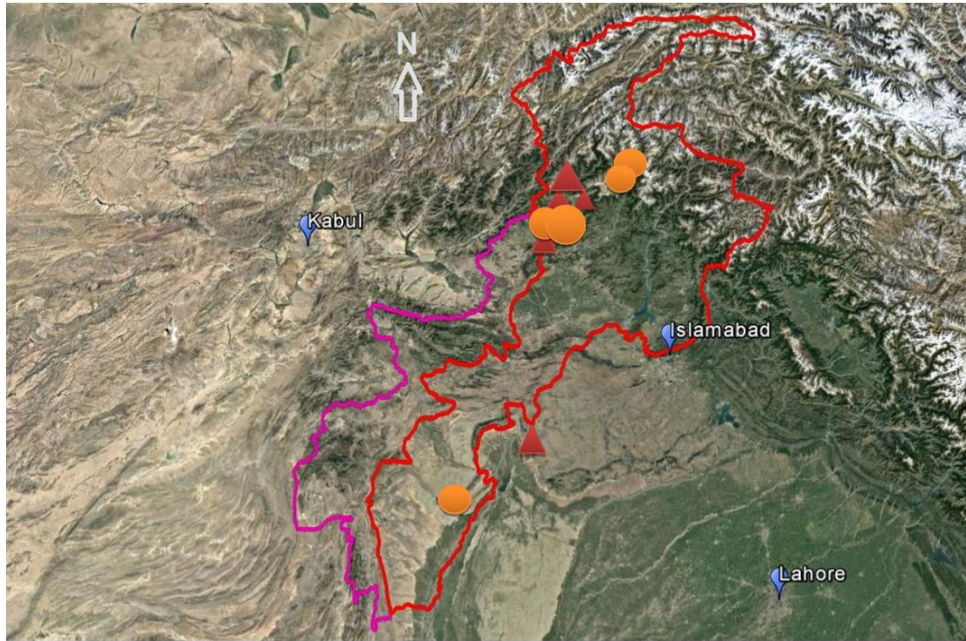
Beg, (2001), Butt *et al.* (2006), Mukhtar *et al.* (2012), Mukhtar, (2013) Mukhtar, (2015) and Tahir *et al.* (2016), added more fauna to hidden fauna of spiders of Pakistan. Moreover, Perveen and Jamal, (2012), checklist gives idea of spread of species in FATA Peshawar Khyber Pakhtunkhwa region.

The *Sparassidae* (Araneae: Sparassidae) represents 13 species from Pakistan (world spider catalog, 2016), most of them not checked again to confirm their status as mostly work occur before partition from British India (see Dayal, 1935, Simon, 1880, O.P. Cambridge, 1885, Thorell, 1891, Pocock, 1901, Caporiacco, 1935). Only species of *Sparassidae* was reported recently (Jager, 2005). Family *Pholcidae* have 80 genera and thousands species represent no species from Pakistan (world spider catalog, 2016).

Present work to explore the unknown fauna of araneae of Pakistan. Which is part of exploration of biodiversity of Northern West Hindukush region of Pakistan (Ali *et al.*, 2016) (Figs. 1, 2). To report new records of spider (Araneae: Arachnidae) fauna of Pakistan.



**Fig. 1.** Map of study area of Khyber Pakhtun khwa and FATA, Pakistan.



**Fig. 2.** Distribution of the of species in Khyber Pakhtunkhwa and FATA Pakistan. *Olios anguinifrons* (Simon 1906); *Crossoprizama culipes* (Spassky, 1934).

### Materials and methods

Spiders males and females, vials, 80% alcohol, depression slides, Stereomicroscope, ower light, Leica MZ 1600, Nikon eclipse ME600 compound microscope, camera lucida, cover slips,

### Observation

The males and females were observed under stereomicroscope while Photographs of bodies in alcohol were taken with a Leica MZ 1600. and Measurements are given in millimeters. Carapace length was measured from the base to rear margin of the carapace medially; carapace width measured as maximum width.

Abdomen length measured to the end of anal tubercle, not including spinnerets; width is the maximum. Ocular area and eye row measurements include lenses of relevant eyes.

Abbreviations: AME= Anterior median eyes, ALE= Anterior lateraleyes, PLE= Posterior lateral eyes, PME= posterior median eyes, AER= Anterior eye row, RTA= retrolateral tibial apophysis, E= embolus, TA= for tegular apophyses. Male pedipalps were removed for study and placed in a depression slide,

examined with incident light on a Nikon eclipse ME600 compound microscope. Drawings were made with a drawing tube on this compound microscope. All laboratory work was carried out in the Madison Lab, University of British Columbia, Canada, All measurements are taken in millimeter (mm).

### Data Collection

Data of spiders were collected from different parts of the Khyber Pakhtunkhwa Province and FATA regions by pitfall trap with 70% alcohol and 30% glycerin, some were collected by hands with capturing tubes, beating sheet and sweeping on grasses during different parts of the day and different types of environmental conditions. The vial was labeled and preserved.

### Results

The collected samples were identified by using literatures and comparing genitalia and other somatic characters. The species classified into family Pholcidae and family Sparassidae (Table 1). The details of each species and their genus and family is given separately. The measurements and morphological characters are explained as under.

Family Pholcidae C. L. Koch, 1850

Genus Crossopriza Simon, 1893

*Crossopriza* Simon, 1893: 476-477.

Genus *Chrisossopriza* have deep round depression between head and thorax shorter abdomen, rarely reach to height of posterior abdomen. Embolus short assimilated with conductor.

*Cross oprizamaculipes* (Spassky, 1934)

Types of materials observed

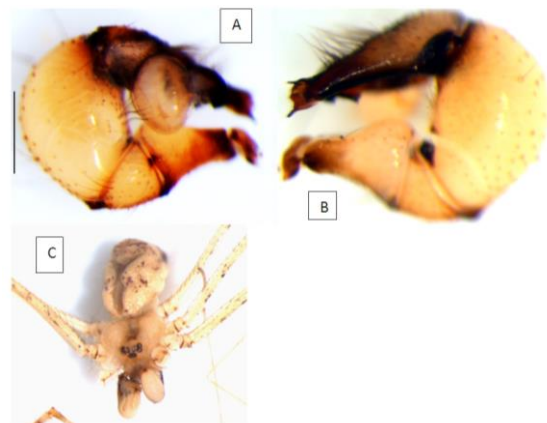
Khyber Pakhtunkhwa, Malakand, (Manzari Baba), 71.71E, 34.52N, a.s.l. 1213m, 1(♂,♀). Malakand, Batkhela, 71.98E, 34.61N, a.s.l. 1113m, 2(♂,♀), (13 July 2015). Aladand 72.04E, 34.59N, a.s.l. 896m, 2 (♀), Totakan, 71.85E, 34.61N, a.s.l. 940m, 3(♂,♀), Agra, 71.71E, 34.58N, a.s.l. 1470m, 2(♂) (09 July 2015).

Description of male; carapace length, 2.90, carapace width, 2.13. Abdomen length 2.40, Abdomen width 2.30, Eyes: AME width 0.16, ALE width 0.47, PME 0.36, PLE 0.59, Leg I: femur 15.22, patella 9.41, tibia 4.30, metatarsus 10.21, tarsus 2.29. Leg II: femur 11.51, patella 7.51, tibia 4.21, metatarsus 8.19, tarsus 3.11. Leg III: femur 11.53, patella 8.43, tibia 3.29, metatarsus 7.40, tarsus 3.04. Leg IV: femur 10.39, patella 5.90, tibia 4.50; metatarsus 10.33, tarsus 2.29.

**Table 1.** Classification of Species into Genus and Family.

Family	Genus	Species
Family Pholcidae C. L. Koch, 1850	<i>Cross opriza</i> Simon, 1893:	<i>Cross oprizamaculipes</i> (Spassky, 1934)
<i>Sparassidae</i> Bertkau, 1872	<i>Olios</i> Walckenaer, (1837)	<i>Olios anguinifrons</i> (Simon, 1906)

Description of male; carapace has paler colour with dark chitinized central area and wider than long, clypeal area elevated AME and PME making U shaped appearance, ALE pair and PLE are close to each other, chelicera, maxillae, labium dark pale in colour. All legs have femora withish pale or with some scattered dark stain. Abdomen dorsum integument pale with scattered dark stain. Venter is yellow pale. Palp pale swelled embolus embedded and short. (Figs. 3: A; B; C). Females of the species was immature.



**Fig. 3.** A; prolateral view of Palp, B; retrolateral view of pal p; C; body: 0.3mm scale bar.

Family Sparassidae Bertkau, 1872

Genus *Olios* Walckenaer, (1837)

Simon, 1906.

Diagnosis, Genus *Olios* was established by Simon, 1906. *Olios* species have bent embolus and long tegularophysis and two Retro lateral tibial Phophysis, 2 anterior cheliceral teeth and 2 rows of eyes arrangement (Jäger, *et al.*, 2002).

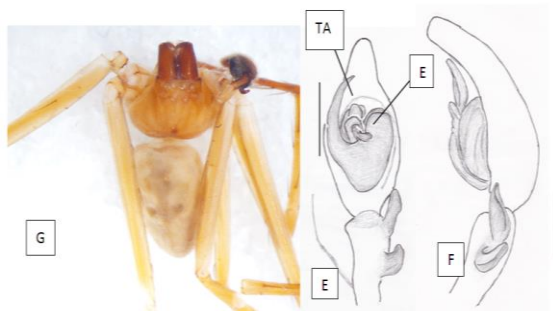
*Types of Material examined.*

Khyber Pakhtunkhwa, Totakan, 71.76E, 34.65N, 1149m 1(♂), Agra, 71.70E, 34.57N, 1670m 1(♂), Batagram, 73.02E, 34.68N, 2013m (♂). Thakot, 72.91E, 34.78N, 1619m 1 (♂) (27 June, 2014; 9 July, 2015) *Olios anguinifrons* (Simon 1906). Measurements male; carapace length, 3.40, carapace width 2.60. abdomen length 3.90, abdomen width 2.90. Anterior eyes row (AER) width 1.90, posterior eyes width (PER), 1.93, Leg I: femur 4.62, patella 2.41, tibia 2.50, metatarsus 4.21, tarsus 3.09. Leg II: femur 5.31, patella 3.01, tibia 3.91, metatarsus 4.94, tarsus 3.81. Leg III: femur 4.83, patella 3.73, tibia 3.79, metatarsus 4.50, tarsus 3.94. Leg IV: femur 4.97, patella 3.13, tibia 3.40; metatarsus 4.13, tarsus 4.99.

Description of male; Chelicerae with 2 promargin and 5 retromargintooth. Bright greyish yellow carapace. Chelicerae brown with darker fangs. Carapace wider and flatted.



All legs withish yellow long. Abdomen dorsum grey with scattered hairs. Venter whitish grey. Male palp with two RTA and bent embolus, with tegular apophysis. (Figs. 4. D; E; F).



**Fig. 4.** G; body, E; Ventral view of Palp, F; retrolateral view of palp; E= embolus, TA= tegular apophysis: 0.4 mm on scale bar

### Discussion

Present study to reveal the unknown spiders (Araneae: Arachnida) fauna of North West Province and adjacent FATA Pakistan. The current results shows spiders fauna of Pakistan is diversified and new records shows that this region have more biodiversity hot spots. (Figs. 1. 2).

Genus *Olios* Walckenaer, (1837) of Family Sparassidae which have more than 220 species world wide. Dayal, (1935) also reported 2 species from Lahore in British India. The species *Olios sanguifrons* (Simon, 1906) previously reported by Simon, 1906. From India, while also spread in China (Jäger *et al.*, 2002). This *O. sanguifrons* species is first time recorded from Pakistan in current study, which shows the current study area have more biodiversity to explore. The family Pholcidae members distributed world wide.

The genus *Crossopriza* of family Pholcidae represents 8 species worldwide, While India, Afghanistan and Turkmenistan have some of them (World Spider Catalog, 2016). Before present study none of them reported from Pakistan. *Crossopriza maculipes* (Spassky, 1934) was first time reported from Turkmenistan. The species is Palearctic in nature but also have extended region to East side. It was reported from Uzbekistan, Turkmenistan and Tajikistan (Huber *et al.*, 2014).

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