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Faunistics And Taxonomic Study Of Spider (*Arachnida: Araneae*) Fauna In District Battagram Kp, Pakistan

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ABSTRACT

The current study investigated spiders (*Arachnida: Araneae*) Fauna in the Battagram District from March to November of 2022. All around up to 900 spider specimens were collected by using a variety of methods, such as the use of bark pitfall traps, ground pitfall traps, cryptic searching, aerial hand collection, ground hand collection, vegetation beating, and white beating sheets from 31 locations throughout the research area, and then were kept in 70% ethanol, and were then classified into 15 families, 41 genera, and 53 species using taxonomic keys of (Tikader, 1987;) and online keys on http://araneae.nmbc.ch/; Ali, 2017. The families that have been confirmed are *Agelenidae, Araneidae, Corinnidae, Gnaphosidae, Idiopidae, Lycosidae, Pisauridae, Salticidae, Sparassidae, Palpimanidae, Pholcidae, Tetragnathidae, Theridiidae, Thomisidae, Oxyopidae. From the research area, all species have been discovered for the first time; however, Aculepeira carbonaria, Agelena orientalis, Allagelena gracilens, Araniella inconspicua, Agalenatea redii, Araniella proxima, Araneus angulatus, Araniella opisthographa, Bassaniodes bufo, Cambalida flavipes, Drassyllus lutetianus, , Gnaphosa leporina, Histopona torpida, Heriaeus simoni, Langona aperta, Palpimanus gibbulus, Parasyrisca schenkeli, Pardosa bifasciata, Pisaura mirabilis, Tegenaria lapicidinarum, Tegenaria silvestris, Thyene calebi, Xysticus bifasciatus* and *Xysticus ferrugineus*, for the first time from Pakistan. The Araneidae family was the most prevalent family with 13 species classified under 9 genera; the least number of species reported belonged to the *Palpimanidae, Pisauridae,* and *Theridiidae* families. Further investigation into the spider fauna of Battagram could potentially commence from the current study.

Keywords: Arachnida, Araneae, Taxonomy, Fauna, Spider, Battagram.

INTRODUCTION

Pakistan is mostly an agricultural country with a diverse range of fauna. A large portion of the land is utilized for the cultivation of different crops, which provide as home for different kinds of invertebrates. The spider is one of the more prominent members of the community among them, although historically it has received less attention from scientists who view it as a minor organism (Abida Butt & Beg, 2001); (Perveen *et al.*, 2012).

Members of the Araneae order of arachnids are referred to as "spiders" (Arthropoda: Chelicerata: Arachnida) (R. Singh, 2022). Spiders are found all over the world and are very competent at adjusting to any kind of natural setting, with the exception of the open sea and the air (Subedi *et al.*, 2022). After one order of arachnids (Acari) and the five major orders of insects (Coleoptera, Diptera, Hymenoptera, Hemiptera, and Lepidoptera), Araneae ranks seventh in terms of species diversity (Sharma *et al*., 2020) containing 4,265 genera, 132 families, and 50,220 species (R. Singh, 2022). Approximately forty spider species are poisonous and can fatal to humans (Platnick, 2006). Spiders also differ widely in form; some have extended, cylindrical rear ends, while others have very rounded, ball-like abdomens (Borowiec, 2022). *Theridiosomatidae (Araneae: Araneoidea)* is a family of tiny spiders (body length, 0.5–3 mm) (Suzuki *et al.*, 2022). They undergo ecdysis (molting) to complete their metamorphosis (Sajid et al., 2021a). Researchers are looking at the chemical makeup of silk and spider venom (Oldrati *et al.*, 2017). These findings could have implications for biomaterials, (Vollrath and Knight, 2001), pharmaceuticals (Herzig *et al.*, 2020) and technologies (Hajian et al., 2024); (Moradmand and Yousefi, 2022). Spider lifespans range from two years to twenty years. Male spiders have a shorter lifespan than female spiders. Male spiders mature between a year and two after birth, and they face death after mating (Ghar *et al*., 2022). A female's egg sac can hold from several hundred to a thousand eggs, each of which contains a hatchling that is protected from temperature fluctuations, parasitoids, predators, and parasitic parasites (Ewunkem & Agee, 2022). Spiders have a significant economic worth. Being primarily entomophagous predators, they not only serve as efficient bio-indicators of various environments but also manage insect populations in agroecosystems and the wild (Tiwari & Singh, 2021) ; (Tikader, 1987) ; (Raju *et al.*, 2021). In the food chain, spiders are an essential link (Dubey *et al.*, 2021). The silk, venom, and hemolymph of spiders are useful materials for pharmaceutical research, biological engineering, and medical treatment (Lia *et al.*, 2022). Communities of species-rich spiders can control the density of prey (Palaspagar, 2022). In spite of these proclaimed values, very little attention has been paid to spider conservation (Molur, Siliwal, & Daniel, 2008) (G. Singh & Singh, 2021). In addition, by describing new species, changing their status, and making other nomenclatural choices, researchers are advancing our understanding of spider taxonomy.

Materials and Methods

Study Area

The current investigation was carried out in Battagram District. Battagram, which has a total surface area of 1,301 Km^2, is situated in the western region of Khyber Pakhtunkhwa, Pakistan, between 34^o 33′ and 34^o 47′ N and 72^o 54′ and 73^o 15′ E. (Haq, 2012). Battagram is home to lush forest peaks with elevations ranging from 525 meters at Thakot to more than 4690 meters at Sukaisar (HAQ¹, AHMAD, & ALAM, 2011). It is bounded to the east by the Mansehra district, to the south by the Torghar district, to the west by the Shangla district, and to the north by the Kohistan district (Ahmad *et al.*, 2020). Climates ranging from subtropical to "alpine" are covered by the intricate ecology. Battagram is a place of flourishing agriculture, wilderness, woodlands, and grasslands (Bibi *et al.*, 2021). The well-known Western Himalayan Moist Temperate Ecology states that District Battagram's vegetation zones fall under the moist temperate category (Haq, Ahmad, & Alam, 2011).

Collection of Spiders

Spider specimens were collected from March to November from 31 different locations in the District of Battagram, which included hills, marshy areas, fields, land, subsurface, structures, vegetation, dry timber, valleys, and flat areas and methods include;

- ❖ Ground Pitfall trap
- ❖ Bark Pitfall Trap
- ❖ Cryptic searching
- ❖ Ground hand collection
- ❖ Aerial hand collection
- ❖ White Beating Sheet

Figure 1: White Beating Sheet

Figure 2: Bark Pitfall Trap

Specimens Preservation

The collected spiders were stored in separate vials with 70% ethanol. Each specimen's specific information was written on its corresponding tube. These could contain the time, date, and location of the collection. Additionally, several significant specimens were kept in 100% ethanol for use in molecular research.

Identification of Spiders

Under a stereo microscope, spiders belonging to 15 families, 41 genera, and 53 species were identified by the use of taxonomic keys of Tikder (1987) and online Keys at (http://araneae. nmbc.ch; Ali, 2017).

Results and Discussion

The purpose of the current study was to determine the diversity of spiders in different habitats in District Battagram, KP, Pakistan. The investigation identified 53 species, 41 genera, and 15 families within the *Araneae* order. All the species are documented for the first time from research area while *Gnaphosa leporina, Tegenaria lapicidinarum, Allagelena gracilens, Thyene calebi, Pisaura mirabilis, Pardosa bifasciata, Aculepeira carbonaria, Tegenaria silvestris, Araniella proxima, Drassyllus lutetianus, Araniella opisthographa, Xysticus ferrugineus, Histopona torpida, Langona aperta, Cambalida flavipes, Araniella inconspicua, Palpimanus gibbulus, Cambalida flavipes, Agalenatea redii, Parasyrisca schenkeli, Xysticus bifasciatus, Agelena orientalis, Heriaeus simoni, Pisaura mirabilis, Bassaniodes bufo* and *Araneus angulatus,* for the first time from Pakistan.

Taxonomy

Family: Agelenidae (Funnel web- or Cobweb spiders) (C. L. Koch, 1837)

***Tegenaria lapicidinarum* (Spassky, 1934)**

Material examined: Gangwal 6♂ and 2♀, 34.821102N, 73.156448E, 1849m a.s.l. Gallai Medan 2♂ and 2♀, 34.861039N, 73.194125E, 2806m a.s.l. 18-vii-22.

Global Distribution: Russia (Europe), Ukraine (WSC, 2024).

Comments/Remarks: There are no prior records of this species from Pakistan. Current research has verified its presence in the country's northernmost region.

***Tegenaria silvestris* (L. Koch, 1872)**

Material Examined: Parra 4♂ and 1♀, 34.925595N, 73.06408E, 2200m a.s.l. Baba Zangal 3♂ and 1♀, 34.925308N, 73.06867E, 2420m a.s.l. 13-vi-22. Meeran Hills 1♂, 34.584339N, 72.994E, 1711m a.s.l. 03-ix-22.

Global Distribution: Europe (WSC, 2024) and new to Pakistan.

Comments/Remarks: There have never been any reports of *Tegenaria silvestris* from Pakistan. The study area and Pakistan were the first places where this particular species was discovered.

***Histopona torpida* (C. L. Koch, 1837)**

Material Examined: Baba Zangal 3♂, 34.925308N, 73.06867E, 2420m a.s.l. 13-vi-22.

Global Distribution: Caucasus, Europe (WSC, 2024) and new to Pakistan.

Comments/Remarks: Prior records of *Histopona torpida* from Pakistan are nonexistent. Pakistan and the research area were the first places where the species was discovered.

***Allagelena gracilens* (C. L. Koch, 1841)**

Material Examined: Gangwal 3♂ and 2♀, 34.821102N, 73.156448E, 1849m a.s.l. 18-vii-22. Nogram 2♀, 34.821579N, 73.097748E. 21-vii-22. Ajpora 3♂ and 1♀, 34.589055N, 73.038963E, 1449m a.s.l. 13-viii-22. Meeran Hills 1♂ and 1♀. 34.584339N, 72.994E, 1711m a.s.l. 03-ix-22.

Global Distribution: Central Asia to Europe (WSC, 2024) and new to Pakistan.

Comments/Remarks: There was no data about the targeted species in Pakistan.

***Agelena orientalis* (C. L. Koch, 1837)**

Material Examined: Biland Kot 2♂, 34.58658N, 72.956903E, 1909m a.s.l. 12-iv-22. Manser 1♂ and 4♀. 34.653088N, 72.963237E, 1475m a.s.l. 07-v-22.

Global Distribution: Iran, Iraq and Italy to Central Asia (WSC, 2024), and new to Pakistan.

Comments/Remarks: On the Pakistani *Agelena orientalis*, no information was discovered.

Family: Araneidae (Orbweb spiders) (Clerck,1757)

***Araniella nympha* (Simon, 1889)**

Material Examined: Kuzabanda 3♂ and 2♀, 34.63301N, 73.008243E, 1169m a.s.l. 07-iii-22. Matta Torkhail, 1♂, 34.622718N, 73.002446E, 1220m a.s.l. 17-iii-22. Gijbori 1♂ and 3♀, 34.654325N, 72.976635E, 1277m a.s.l. 09-v-22. Pashto 9♂ and 3♀, 34.910452N, 73.043002E, 1792m a.s.l. 09-vi-22. Kandao Paiza 3♂ and 4♀, 34.834987N, 73.04479 E, 1463m a.s.l. 10-vi-22. Jab Khwar 1♂ and 1♀, 34.904715N, 73.047527E, 1667m a.s.l. 12-vi-22. Dheri Mashakhail 1♂ and 1♀, 34.677767N, 72.968732E, 1552m a.s.l. 02-x-22. Izhar Ullah and Akhtar Ali.

Global Distribution: China, Pakistan, India (WSC, 2024).

Comments/Remarks: (Dyal, 1935) reported this species from Lahore and (Qadir, 1997) recorded it from Sialkot and (Mukhtar, 2004) reported it from different localities i.e. Gujranwala, Lahore and Kasur.

***Araniella opisthographa* (Kulczyński, 1905)**

Material Examined: Peerhari 4♂ and 2♀, 34.614692N, 72.963449E, 1585m a.s.l. 16-iv-22. Battagram 1♂, 34.67809N, 73.02416E, 1036m a.s.l. 26-iv-22. Bartonay 3♂ and 1♀, 34.682625N, 72.948424E. 17-v-22.

Global Distribution: Turkey, Caucasus, Europe, Russia (Europe) to Central Asia, Iran, (WSC, 2024) and new to Pakistan.

Comments/Remarks: This species has never been reported from Pakistan before.

***Araniella proxima* (Kulczyński, 1885)**

Material Examined: Shabora 4♂, 34.640558N, 73.02433E, 1711m a.s.l. 12-iii-22. Paimal 1♂, 34.742278N, 72.998298E. 18-v-22.

Global Distribution: Turkey, Europe, North America, Kazakhstan, Russia, (Europe to Far East), (WSC, 2024) and new to Pakistan.

Comments/Remarks: There were no records of the concerned species in Pakistan.

***Araniella inconspicua* (Simon, 1874)**

Material Examined: Manser 5♂ and 1♀, 34.653088N, 72.963237E, 1475m a.s.l. 07-v-22. Pokal 1♂ and 1♀, 34.814791N, 73.071696E. 15-vii-22. Shikrah 2♂, 34.671448N, 72.956061E, 1851m a.s.l. 03-x-22.

Global Distribution: Central Asia, Turkey, China, Iran, Europe and Russia (from Europe to the Far East) (WSC, 2024) and new to Pakistan.
Comments/Remarks: No past record was found of the subjected species from Pakistan.
***Araniella cucurbitina* (Clerck, 1757)**
Material Examined: Kuzabanda 3♂ and 1♀, 34.63301N, 73.008243E, 1169m a.s.l. 07-iii-22. Paimal 1♂ and 1♀, 34.742278N, 72.998298E. 18-v-22. Batangai 7♂ and 4♀, 34.912014N, 73.046762E, 1928m a.s.l. 12-vi-22.
Global Distrbution: Korea, Europe, Russia (Europe) to Central Asia, Turkey, China, (WSC, 2024).
Comments/Remarks: An earlier report of *Araniella cucurbitina* from the District of Faisalabad, Punjab, Pakistan was made by (Rana *et al.,* 2019). Additionally, District Battagram revealed its presence for the first time in this survey.
***Cyclosa confraga* (Thorell, 1892)**
Material Examined: Manser 5♂ and 7♀, 34.653088N, 72.963237E, 1475m a.s.l. 07-v-22. Ajpora 15♂ and 8♀, 34.589055N, 73.038963E, 1449m a.s.l. 13-viii-22. Shamlai Thor 10♂ and 12♀, 34.67667N, 73.133215E, 1844m a.s.l. 15-viii-22. Dheri Mashakhail 2♂ and 2♀, 34.677767N, 72.968732E, 1552m a.s.l. 02-x-22. Shikrah 1♂ and 1♀, 34.671448N, 72.956061E, 1851m a.s.l. 03-x-22.
Global Distribution: Bangladesh to Malaysia, India, Pakistan, (WSC, 2024).
Comments/Remarks: Dyal, S. (1935) described it from Lahore, (Mukhtar, 2004) stated it from Attock, Chakwal, and Jehlum. (Khatoon, 1986) identified it from Islamabad, and (Qadir, 1997) reported it from Sialkot. (Ghazanfar *et al.,* 2016) recorded it from Punjab. This species is documented for the first time from District Battagram.
***Neoscona mukerjei* (Tikader, 1980)**
Material Examined: Gantar 7♂ and 10♀, 34.853465N, 73.149881E. 22-vii-22. Izhar Ullah.
Global Distribution: Pakistan, India, Bangladesh (WSC, 2024).
Comments/Remarks: (Sameem, 2012) reported it from Malakwal, Upper Punjab. (Ghazanfar *et al.,* 2016) also reported it from Punjab. (Mukhtar *et al.,* 2012) reported from different sites in Punjab. (Tahir *et al.,* 2011) reported from Pakistan.
***Aculepeira carbonaria* (L. Koch, 1869)**
Material Examined: Batila 4♂, 5♀, 34.841184N, 73.096092E, 1556m a.s.l. 11-vi-22. Pokal 2♂ and 4♀, 34.814791N, 73.071696E. 15-vii-22.
Global Distribution: Southern Europe, Kazakhstan, Alps, Turkey, China, Russia (Europe and Central Asia), (WSC, 2024) and fresh to Pakistan.
Comments/Remarks: As far as we know, Pakistan has no records of this species. Evidence supporting its presence was gathered for the current study from District Battagram in Khyber Pakhtunkhwa, Pakistan.
***Agalenatea redii* (Scopoli, 1763)**
Material Examined: Battagram 3♂ and 2♀, 34.67809N, 73.02416E, 1036m a.s.l. 26-iv-22. Kandao Paiza 4♂ and 3♀, 34.834987N, 73.04479E, 1463m a.s.l. 10-vi-22. Izhar Ullah.
Global Distribution: Russia (Europe to South Siberia), Azores, China, Caucasus, Europe, Central Asia, Iran, Turkey (WSC, 2024) and new to Pakistan.
Comments/Remarks: There are no known records of *Agalenatea redii* from Pakistan. Initially documented by a examine materials from district Battagram.
***Araneus angulatus* (Clerck, 1757)**
Material Examined: Rashang 1♀, 34.819251N, 73.115735E. 20-vii-22. Nogram 2♂ and 1♀, 34.821579N, 73.097748E. 21-vii-22.
Global Distribution: Iran, Europe, Russia, Turkey, (Europe to Far East), Korea, Central Asia (WSC, 2024) and now reported from Pakistan.
Comments/Remarks: This species has not been documented in Pakistan, as far as we know. The current study from district Battagram in Khyber Pakhtunkhwa, Pakistan, proved its existence.
***Bijoaraneus mitificus* (Simon, 1886)**
Material Examined: Ajpora 7♂ and 5♀, 34.589055N, 73.038963E, 1449m a.s.l. 13-viii-22. Meeran Hills 6♂ and 7♀, 34.584339N, 72.994E, 1711m a.s.l. 03-ix-22.
Global Distribution: Philippines, Bangladesh, Pakistan, Cambodia, China, Taiwan, India, Thailand, Singapore, New Guinea (WSC, 2024).
Comments/Remarks: (Ullah and Zahid, 2022) recounted *Bijoaraneus mitificus* from District Swat Khyber Pakhtunkhwa, Pakistan.
***Eriovixia excelsa* (Simon, 1889)**

Material Examined: Kuzabanda 2♂ and 4♀, 34.63301N, 73.008243E, 1169m a.s.l. 07-iii-22. Jab Khwar 4♂ and 8♀, 34.904715N, 73.047527E, 1667m a.s.l. 12-vi-22. Parra 6♂ and 9♀, 34.925595N, 73.06408E, 2200m a.s.l. 13-vi-22. Baba Zangal 3♂ and 11♀, 34.925308N, 73.06867E, 2420m a.s.l. 13-vi-22. Banna 5♂ and 12♀, 34.830039N, 73.063751E. 23-vii-22. **Global Distribution**: South Africa, India, Indonesia, Thailand, Taiwan, Philippines, Pakistan. Introduced to Eswatini, China, (WSC, 2024).
Comments/Remarks: (Dyal, 1935) earlier documented it from the eastern part of Pakistan (Lahore). (Luqman *et al.,* 2021) described it from Buner valley with a taxonomic study from February 2018 to January 2019. (Sajid *et al.,* 2021) also logged it from District Dir Lower Pakistan. (Vetter *et al.*, 2013) recounted it from Faisalabad Pakistan and (Ghazanfar *et al.,* 2016) re-counted it from Sindh.

***Hypsosinga heri* (Hahn, 1831)**
Material Examined: Shabora 4♂ and 2♀, 34.640558, N, 73.02433E, 1711m a.s.l. 12-iii-22. Matta Torkhail 2♂ and 1♀, 34.622718N, 73.002446E, 1220m a.s.l. 17-iii-22. Biland kot 5♂ and 3♀, 34.58658N, 72.956903E, 1909m a.s.l. 12-iv-22. Bartonay 4♂ and 6♀, 34.682625N, 72.948424E. 17-v-22. Kandao Paiza 4♂ and 1♀, 34.834987N, 73.04479E, 1463m a.s.l. 10-vi-22. Parra 5♂ and 3♀, 34.925595N, 73.06408E, 2200m a.s.l. 13-vi-22. Baba Zangal 4♂ and 6♀, 34.925308N, 73.06867E, 2420m a.s.l. 13-vi-22. Pokal 7♂ and 9♀, 34.814791N, 73.071696E. 15-vii-22. Gallai Medan 3♂ and 5♀, 34.861039N, 73.194125E, 2806m a.s.l. 18-vii-22. Nogram 2♂ and 6♀, 34.821579N, 73.097748E. 21-vii-22. Dheri Mashakhail 2♂ and 3♀, 34.677767N, 72.968732E, 1552m a.s.l. 02-x-22.
Global Distribution: Russia (Europe to Central Asia, West Siberia), Caucasus, Europe, Central Asia, China, Iran, Israel (WSC, 2024).
Comments/Remarks: (Vetter *et al.,* 2013) recorded the *Hypsosinga* Species from Faisalabad Pakistan.

Family: Corinnidae (Karsch, 1880)
***Cambalida flavipes* (Gravely, 1931)**
Material Examined: Shabora 1♂ and 1♀, 34.640558N, 73.02433E, 1711m a.s.l. 12-iii-22. Peerhari 1♂ and 2♀, 34.614692N, 72.963449E, 1585m as.l. 16-iv-22. Paimal 1♂ and 2♀, 34.742278N, 72.998298E. 18-v-22. Pagora 1♀, 34.646473N, 72.067454E. 05-xi-22.
Global Distribution: India (WSC, 2024) and new to Pakistan.
Comments/Remarks: No record was found from Pakistan. *Cambalida flavipes* was new to Pakistan.
***Castianeira zetes* (Simon, 1897)**
Material Examined: Rashang 4♂ and 7♀, 34.819251N, 73.115735E. 20-vii-22.
Global Distribution: India, Pakistan, Bangladesh (WSC, 2024).
Comments/Remarks: (Mukhtar, 2004) identified the subjected species from Punjab, Pakistan.

Family: Gnaphosidae (Ground spiders) (Banks, 1892)
***Parasyrisca schenkeli* (Ovtsharenko & Marusik, 1988)**
Material Examined: Parra 2♂ and 1♀, 34.925595N, 73.06408E, 2200m a.s.l. 13-vi-22. Banna 1♂, 34.830039N, 73.063751E. 23-vii-22.
Global Distribution: Mongolia, China, Kazakhstan, (WSC, 2024) and new to Pakistan.
Comments/Remarks: This species has never before been documented from Pakistan. The present investigation validated its distribution and presence within Pakistan..
***Drassyllus lutetianus* (L. Koch, 1866)**
Material Examined: Dheri Mashakhail 3♀, 34.677767N, 72.968732E, 1552m a.s.l. 02-x-22. **Global Distribution**: Europe to Kazakhstan (WSC, 2024) and new to Pakistan.
Comments/Remarks: No records of this species have been discovered in Pakistan. It was reported from District Battagram in Khyber Pakhtunkhwa, Pakistan, in the current study. ***Gnaphosa lucifuga* (Walckenaer, 1802)**
Material Examined: Shabora 5♂ and 2♀, 34.640558N, 73.02433E, 1711m a.s.l. 12-iii-22. Parra 2♂ and 1♀, 34.925595N, 73.06408E, 2200m a.s.l. 13-vi-22. Baba Zangal 3♂ and 1♀, 34.925308N, 73.06867E, 2420m a.s.l. 13-vi-22.
Global Distribution: China, Iran, Turkey, Russia (Europe to South Siberia), Kazakhstan, Europe, Pakistan, Caucasus (WSC, 2024).
Comments/Remarks: (Ovtchinnikov *et al.,* 2008) reported it from Pakistan (Punjab: Lahore). Additionally, this investigation verified its presence in Pakistan's District Battagram.
***Gnaphosa leporina* (L. Koch, 1866)**
Material Examined: Baba Zangal 1♂ and 1♀, 34.925308N, 73.06867E, 2420m a.s.l. 13-vi-22. Jangrai 1♂, 34.82091N, 73.156457E, 1810m a.s.l. 15-vii-22. Gantar 1♂, 34.853465N, 73.149881E. 22-vii-22.
Global Distribution: China, Iran, Europe, Central Asia, Turkey, Caucasus, Russia (Europe to South Siberia), (WSC, 2024) and new to Pakistan.

Comments/Remarks: Regarding the subject species from Pakistan, no prior records could be located (WSC, 2024). In the current study, Pakistan provided the initial report on it.

Family: Idiopidae (Simon, 1889)

Material Examined: Matta Torkhail, Immature idiopes, 34.622718N, 73.002446E, 1220m a.s.l. 17-iii-22.

Global Distribution: Venezuela, Pakistan, Suriname, West Africa, (WSC, 2024).

Comments/Remarks: (Nazeer, 2008) recorded it from Pakistan. The present study confirmed its distribution by examining materials from District Battagram.

Family: Lycosidae (Wolf spiders) (Sundevall, 1833)

***Lycosa bistriata* (Gravely, 1924)**

Material Examined: Kuzabanda 3♂ and 1♀, 34.63301N, 73.008243E, 1169m a.s.l. 07-iii-22. Peerhari 1♂ and 1♀, 34.614692N, 72.963449E, 1585m a.s.l. 16-iv-22. Manser 18♂ and 11♀, 34.653088N, 72.963237E, 1475m a.s.l. 07-v-22. Kandao Paiza 1♂ and 3♀, 34.834987N, 73.04479E, 1463m a.s.l. 10-vi-22. Parra 2♂ and 6♀, 34.925595N, 73.06408E, 2200m a.s.l. 13-vi-22. Nogram 3♀, 34.821579N, 73.097748E. 21-vii-22.

Global Distribution: India, Bhutan, Pakistan (WSC, 2024).

Comments/Remarks: (Mukhtar *et al.,* 2012) recognized it from Shorkot, district Jhang, Punjab, Pakistan and (Ghazanfar *et al.,* 2016) also stated it from Punjab, Pakistan.

***Lycosa chaperi* (Simon, 1885)**

Material Examined: Peerhari 3♂ and 3♀, 34.614692N, 72.963449E, 1585m a.s.l. 16-iv-22. Shamlai Thor 1♂ and 4♀, 34.67667 N, 73.133215E, 1844m a.s.l. 15-viii-22.

Global Distribution: India, Pakistan, (WSC, 2024).

Comments/Remarks: (Ghazanfar *et al.,* 2016) described it from Sindh and (Kazim *et al.,* 2013) described it from the surroundings of Karachi University and also stated in the current study.

***Lycosa kempi* (Gravely, 1924)**

Material Examined: Ajpora 13♂ and 8♀, 34.589055N, 73.038963E, 1449m a.s.l. 13-viii-22. Dheri Mashakhail 1♂, 34.677767N, 72.968732E, 1552m a.s.l. 02-x-22. Shikrah 2♂ and 2♀, 34.671448N, 72.956061E, 1851m a.s.l. 03-x-22.

Global Distribution: India, Pakistan, Nepal, China, Bhutan (WSC, 2024).

Comments/Remarks: (Ghafoor, 2002) described id from Faisalabad, Pakistan and (A Ghafoor & Mahmood, 2011) recorded from District Gujranwala, Pakistan and (Bukhari *et al*.,) reported it from Faisalabad, Pakistan and (Ghazanfar *et al.*, 2016b) described it from Punjab, Pakistan.

***Pardosa pullata* (Clerck, 1757)**

Material Examined: Pokal 3♂ and 2♀, 34.814791N, 73.071696E. 15-vii-22. Shamlai Thor 4♂ and 7♀, 34.67667N, 73.133215E, 1844m a.s.l. 15-viii-22.

Global Ditribution: Turkey, Caucasus, Europe, Russia (Europe to South Siberia), Central Asia, Kazakhstan, (WSC, 2024).

Comments/Remarks: (Kanwal and Rana, 2020) recorded it from Faisalabad, Punjab, Pakistan.

***Pardosa bifasciata* (C. L. Koch, 1834)**

Material Examined: Ajpora 2♂, 34.589055N, 73.038963E, 1449m a.s.l. 13-viii-22. Meeran Hills 3♂ and 1♀, 34.584339N, 72.994E, 1711m a.s.l. 03-ix-22.

Global Distribution: Russia (Europe to South Siberia), China, Europe, Nepal, Turkey, Kazakhstan, Caucasus, (WSC, 2024) and new to Pakistan.

Comments/Remarks: There have never been any publications about this species from any part of the nation (Pakistan). Through the examination of samples from District Battagram, the current inquiry confirmed its existence in Pakistan.

***Pardosa pseudoannulata* (Bösenberg & Strand, 1906)**

Material Examined: Shabora 5♂ and 1♀, 34.640558N, 73.02433E, 1711m a.s.l. 12-iii-22. Battagram 4♂ and 7♀, 34.67809N, 73.02416E, 1036m a.s.l. 26-iv-22. Batila 3♂ and 2♀, 34.841184N, 73.096092E, 1556m a.s.l. 11-vi-22.

Global Distribution: Indonesia (Java), Bhutan, Nepal, Pakistan, India, China, Japan, Korea, Philippines Laos, Taiwan (WSC, 2024).

Comments/Remarks: (Mukhtar, Khan, et al., 2012a) recorded it from Sahiwal and Sargodha. (Ghazanfar et al., 2016b) examined it from Punjab, Pakistan, and the present study also established their existence by examining materials from District Battagram.

***Pardosa pusiola* (Thorell, 1891)**

Material Examined: Pashto 4♂ and 3♀, 34.910452N, 73.043002E, 1792m a.s.l. 09-vi-22. Jab Khwar 2♂ and 2♀, 34.904715N, 73.047527E, 1667m a.s.l. 12-vi-22. Jangrai 1♂ and 1♀, 34.82091N, 73.156457E, 1810m a.s.l. 15-vii-22.

Global Distribtion: Myanmar, Bhutan, China, Bangladesh, Indonesia (Java), Malaysia, Sri Lanka, Nepal, Laos, India (WSC, 2024).
Comments/Remarks: (Mukhtar *et al.*, 2012) described it from, Punjab, Pakistan and (Ghazanfar *et al.*, 2016b) verified it from Punjab, Pakistan. This species is noted for the first time from District Battagram.
***Hippasa holmerae* (Thorell, 1895)**
Material Examined: Gijbori 3♂ and 2♀, 34.654325N, 72.976635E, 1277m a.s.l. 09-v-22. Batangai 1♂ and 2♀, 34.912014N, 73.046762E, 1928m a.s.l. 12-vi-22. Parra 3♂ and 2♀, 34.925595N, 73.06408E, 2200m a.s.l. 13-vi-22.
Global Distribution: Taiwan, India to Philippines, China (WSC, 2024).
Comments/Remarks: (Ghafoor, 2002) reported it from Faisalabad, Pakistan and current research recognized its existence.
***Evippa praelongipes* (O. Pickard-Cambridge, 1871)**
Material Examined: Gallai Medan 3♂ and 4♀, 34.861039N, 73.194125E, 2806m a.s.l. 18-vii-22.
Global Distribution: Kazakhstan, Libya to Saudi Arabia, Pakistan, Turkmenistan?, Israel, India? (WSC, 2024).
Comments/Remarks: (Mukhtar *et al.*, 2012) and (Ghazanfar *et al.*, 2016) testified this species from Punjab, Pakistan.
Family: Pisauridae (Simon, 1890)
***Pisaura mirabilis* (Clerck, 1757)**
Material Examined: Pashto 2♂ and 1♀, 34.910452N, 73.043002E, 1792m a.s.l. 09-vi-22. Rashang 2♂, 34.819251N, 73.115735E. 20-vii-22. Banna 1♂, 34.830039N, 73.063751E. 23-vii-22.
Global Distribution: Caucasus, Central Asia, Europe, Turkey, Russia (Europe to Middle Siberia), Middle East, China (WSC, 2024) and now reported from Pakistan.
Comments/Remarks: *P. mirabilis* is listed for the first time from Pakistan with no previous record according the WSC, 2024.
Family: Salticidae (Jumping spiders) (Blackwall, 1841)
***Hasarius adansoni* (Audouin, 1826)**
Material Examined: Paimal 6♂ and 8♀, 34.742278N, 72.998298E. 18-v-22. Dheri Mashakhail 3♂ and 4♀, 34.677767N, 72.968732E, 1552m a.s.l. 02-x-22.
Global Distribution: Vietnam, Middle East, Africa. Hosted to both Americas, India, Europe China, Taiwan, Laos, Japan, Australia, Pacific Island (WSC, 2024).
Comments/Remarks: Previously recorded from Lahore, Pakistan by (Tahir *et al.*, 2011) and (Kazim *et al.*, 2014) recounted the subjected species from the campus of the University of Karachi, Sindh, Pakistan.
***Langona aperta* (Denis, 1958)**
Material Examined: Batangai 2♂ and 3♀, 34.912014N, 73.046762E, 1928m a.s.l. 12-vi-22.
Global Distribution: India, Iran, Afghanistan (WSC, 2024) and novel to Pakistan.
Comments/Remarks: The present study reported this species for the first time from Pakistan. Prior to now, the nation had no records of the species were found but in current study reported it survival from Pakistan.
***Plexippus paykulli* (Audouin, 1825)**
Material Examined: Biland kot 3♂ and 4♀, 34.58658N, 72.956903E, 1909m a.s.l. 12-iv-22. Kandao Paiza 4♂ and 1♀, 34.834987N, 73.04479E, 1463m a.s.l. 10-vi-22. Jab Khwar 2♂ and 3♀, 34.904715N, 73.047527E, 1667m a.s.l. 12-vi-22. Pagora 4♂ and 7♀, 34.646473N, 72.067454E. 05-xi-22.
Global Distribution: Africa. Introduced to both Americas, Europe, Nepal, Australia, Middle East, Southern Asia, Pacific Island (WSC, 2024).
Comments/Remarks: (Tahir *et al.*, 2011) reported *Plexippus paykulli* from Lahore, Pakistan. (Tahir *et al.*, 2014) described it from the University of Sargodha. (Shakila *et al.*, 2000) stated the subjected species from Pakistan. (Hafiz *et al.*, 2012) reported this species from the University of Sargodha. (Perveen *et al.*, 2012) identified it from Frontier Region (FR) Peshawar, in the Federally Administered Tribal Areas (FATA) of Pakistan.
***Plexippus clemens* (O. Pickard-Cambridge, 1872)**
Material Examined: Bartonay 3♂ and 3♀, 34.682625N, 72.948424E. 17-v-22. Batangai 1♂ and 2♀, 34.912014N, 73.046762E, 1928m a.s.l. 12-vi-22. Gangwal 9♂ and 4♀, 34.821102N, 73.156448E, 1849m a.s.l. 18-vii-22. Ajpora 2♂ and 1♀, 34.589055N, 73.038963E, 1449m a.s.l. 13-viii-22.
Global Distribution: Algeria, Pakistan, Yemen, Iran, India, Egypt, Libya, Turkey, China (WSC, 2024).
Comments/Remarks: (Саджид *et al.*, 2020); (Sajid *et al.*, 2020) documented the subjected species from Pakistan for the first time.

***Menemerus marginatus* (Kroneberg, 1875)**
Material Examined: Peerhari 2♂ and 6♀, 34.614692N, 72.963449E, 1585m a.s.l. 16-iv-22. Pokal 2♂ and 1♀, 34.814791N, 73.071696E. 15-vii-22. Gantar 3♂ and 13♀, 34.853465N, 73.149881E. 22-vii-22.
Global Distribution: Afghanistan, Central Asia, Caucasus (Russia, Azerbaijan), Iran, Pakistan, India, Kazakhstan, United Arab Emirates (WSC, 2024).
Comments/Remarks: (Kazim *et al.*, 2014) recorded the subjected species from Karachi, Sindh, Pakistan and (Bauer *et al.*, 2015) reported it in their study from Pakistan and in current research it is reported from District Battagram.
***Thyene calebi* (Kanesharatnam & Benjamin, 2018)**
Material Examined: Parra 1♂ and 2♀, 34.925595N, 73.06408E, 2200m a.s.l. 13-vi-22. Meeran Hills 1♂, 34.584339N, 72.994E, 1711m a.s.l. 03-ix-22.
Global Distribution: Sri Lanka, India, (WSC, 2024) and fresh to Pakistan.
Comments/Remarks: *Thyene calebi* was not logged previously from Pakistan. In Pakistan and the study area, this species has never been concealed before.
***Phlegra bresnieri* (Lucas, 1846)**
Material Examined: Shabora 2♂ and 3♀, 34.640558N, 73.02433E, 1711m a.s.l. 12-iii-22.
Global Distribution: Southern Europe, Azerbaijan, Ivory Coast, Iran, Yemen, South Africa, Northern Africa, Tanzania, Turkey, (WSC, 2024).
Comments/Remarks: Documented by (Ali, P. A 2023) from Pakistan. In the present study, its existence was confirmed by examined materials from District Battagram.
Family: Sparassidae (Bertkau, 1872)
***Heteropoda afghana* (Roewer, 1962)**
Material Examined: Pashto 1♂ and 1♀, 34.910452N, 73.043002E, 1792m a.s.l. 09-vi-22. Meeran Hills 1♀, 34.584339N, 72.994E, 1711m a.s.l. 03-ix-22.
Global Distribution: Afghanistan, India, Pakistan (WSC, 2024).
Comments/Remarks: (Jager, 2005) described the subjected species from N-Pakistan. No complete literature found on this species.
Family: Palpimanidae (Thorell, 1869)
***Palpimanus gibbulus* (Dufour, 1820)**
Material Examined: Baba Zangal, 1♂ and 2♀, 34.925308N, 73.06867E, 2420m a.s.l. 13-vi-22.
Global Distribution: Central Asia, Mediterranean, (WSC, 2024) and novel to Pakistan.
Comments/Remarks: *Palpimanus gibbulus* is earlier not documented from any region of the country. In the current inquiry, their life is confirmed by examined materials from District Battagram.
Family: Pholcidae (Cellar Spiders) (C. L. Koch, 1850)
***Pholcus phalangioides* (Fuesslin, 1775)**
Material Examined: Jangrai 2♂ and 2♀, 34.82091N, 73.156457E, 1810m a.s.l. 15-vii-22. Rashang 1♂ and 1♀, 34.819251N, 73.115735E. 20-vii-22. Nogram 1♂ and 3♀, 34.821579N, 73.097748E. 21-vii-22.
Global Distribution: Europe, New Zealand, Western Asia. Introduced to the Asia, Africa, Americas, Australia and numerous islands (WSC, 2024).
Comments/Remarks: (Mukhtar, 2004) stated it from Punjab and also described by (Khan and Zaman, 2015) from District Buner. (Lan *et al.*, 2020) reported it from Gilgit Baltistan, Pakistan.
Family: Tetragnathidae (Long-jawed orb-web spiders) (Menge, 1866)
***Leucauge decorata* (Blackwall, 1864)**
Material Examined: Battagram 3♂ and 1♀, 34.67809N, 73.02416E, 1036m a.s.l. 26-iv-22. Batila 1♂ and 1♀, 34.841184N, 73.096092E, 1556m a.s.l. 11-vi-22. Jab Khwar 2♂ and 1♀, 34.904715N, 73.047527E, 1667m a.s.l. 12-vi-22. Banna 4♂ and 5♀, 34.830039N, 73.063751E. 23-vii-22. Shamlai Thor 3♂ and 2♀, 34.67667N, 73.133215E, 1844m a.s.l. 15-viii-22.
Global Distribution: Bangladesh, China, Australia, India, Philippines, Thailand, Pakistan, Indonesia, Tanzania, Nepal, Japan, Papua New Guinea, Mozambique, South Africa (WSC, 2024).
Comments/Remarks: (Mukhtar *et al.*, 2012) described by Sargodha and (Mukhtar *et al.*, 2012) and (Ghazanfar *et al.*, 2016) also known it from Punjab, Pakistan. (Butt and Siraj, 2006) recorded it from the area of Punjab and (Tahir *et al.*, 2010) in the village Kirka found in the Lahore district. The subjected species were noted for the first time from the research area.
Family: Theridiidae (Comb-Footed Spiders) (Sundevall, 1833)
***Theridion confusum* (O. Pickard-Cambridge, 1885)**
Material Examined: Gijbori 3♂ and 4♀, 34.654325N, 72.976635E, 1277m a.s.l. 09-v-22. Batangai 3♂ and 3♀, 34.912014N, 73.046762E, 1928m a.s.l. 12-vi-22.

Global Distribution: Pakistan (WSC, 2024).
Comments/Remarks: (Simmons & Marusik, 2022) documented it in his research work From Pakistan. No detailed literature is available on subjected species but the present study confirmed its distribution from Pakistan.

Family: Thomisidae (Crab spiders) (Sundevall, 1833)

***Runcinia grammica* (C. L. Koch, 1837)**
Material Examined: Nogram 5♂ and 3♀, 34.821579N, 73.097748E. 21-vii-22. Pagora 4♂ and 2♀, 34.646473N, 72.067454E. 05-xi-22.
Global Distribution: Middle East to Iran, Russia (Europe to West Siberia), China, Central Asia, Europa. Introduced to St. Helena, South Africa, Japan (WSC, 2024).
Comments/Remarks: (Mukhtar, 2004) stated the subjected species from Punjab, Pakistan. (Sameem, 2012) known it from Malakwal Mandi Bahaudin, District Upper Punjab Province, Pakistan.

***Xysticus bifasciatus* (C. L. Koch, 1837)**
Material Examined: Rashang 1♂, 34.819251N, 73.115735E. 20-vii-22. Ajpora 1♂ and 2♀, 34.589055N, 73.038963E, 1449m a.s.l. 13-viii-22.
Global Distribution: Caucasus, China, Europe, Central Asia, Russia (Europe to South Siberia), Kazakhstan, Turkey, (WSC, 2024) and new to Pakistan.
Comments/Remarks: No prior records pertaining to the *Xysticus bifasciatus* species were discovered in any region of the entire country (WSC, 2024).

***Xysticus ferrugineus* (Menge, 1876)**
Material Examined: Paimal 1♂ and 4♀, 34.742278N, 72.998298E. 18-v-22**.**
Global Distribution: Europe, China, Turkey, (WSC, 2023) and fresh to Pakistan.
Comments/Remarks: There was no prior documentation of the targeted species discovered in any region of the nation. By analyzing samples from District Battagram, Pakistan, the current research effort revealed it for the first time from Pakistan.

***Synema globosum* (Fabricius, 1775)**
Material Examined: Matta Torkhail 3♂ and 1♀, 34.622718N, 73.002446E, 1220m a.s.l. 17-iii-22. Gijbori1♂ and 2♀, 34.654325N, 72.976635E, 1277m a.s.l. Banna 1♂ and 1♀, 34.830039N, 73.063751E. 23-vii-22.
Global Distribution: Turkey, Caucasus, Iran, Asia, Central China, Russia (Europe to Far East), Europe, Korea, Japan (WSC, 2024).
Comments/Remarks: (Cole, 2017) recognized the *Synema globosum* in their XI book from Pakistan.

***Bassaniodes bufo* (Dufour, 1820)**
Material Examined: Ajpora 1♂ and 3♀, 34.589055N, 73.038963E, 1449m a.s.l. 13-viii-22.
Global Distribution: Mediterranean (WSC, 2024) and novel to Pakistan.
Comments/Remarks: In Pakistan, *Bassaniodes bufo* is revealed for the first time; there are no prior records from the (WSC, 2024).

***Heriaeus simoni* (Kulczyński, 1903)**
MaterialExamined: Manser 3♂ and 1♀, 34.653088N, 72.963237E, 1475m a.s.l. 07-v-22. Meeran Hills 2♂ and 1♀, 34.584339N, 72.994E, 1711m a.s.l. 03-ix-22.
Global Distribution: Albania, Bulgaria, Greece, Croatia, Turkey, Cyprus, (WSC, 2024).
Comments/Remarks: The current research endeavor is the first to be described from Pakistan, and no prior WSC record of the subject species was discovered.

Family: Oxyopidae (Thorell, 1869)

***Oxyopes hindostanicus* (Pocock, 1901)**
Material Examined: Manser 2♂ and 4♀, 34.653088N, 72.963237E, 1475m a.s.l. 07-v-22. Rashang 1♂, 34.819251N, 73.115735E. 20-vii-22. Ajpora 1♂ and 3♀, 34.589055N, 73.038963E, 1449m a.s.l. 13-viii-22.
Global Distribution: India, Sri Lanka, Pakistan, Bangladesh, Maldives, (WSC, 2024).
Comments/Remarks: Already documented by (Ursani & Soomro, 2010) and (Ghazanfar *et al.*, 2016b) from Sindh, Pakistan.

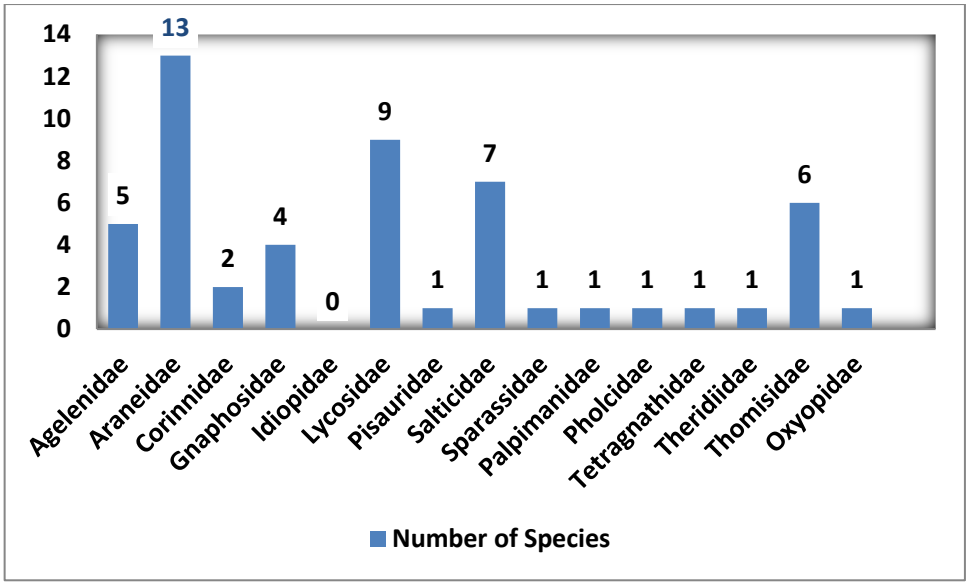


Figure 3: Number Species amongst the Spiders' families documented from District Battagram

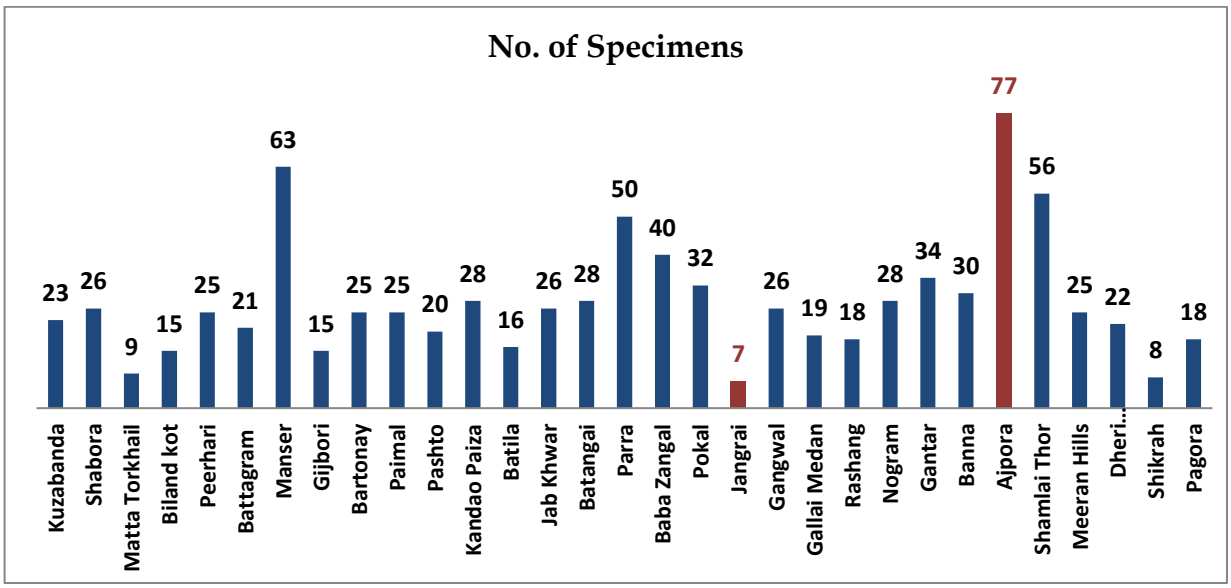


Figure 4: Locality wise richness of Spiders Samples Collected from District Battagram

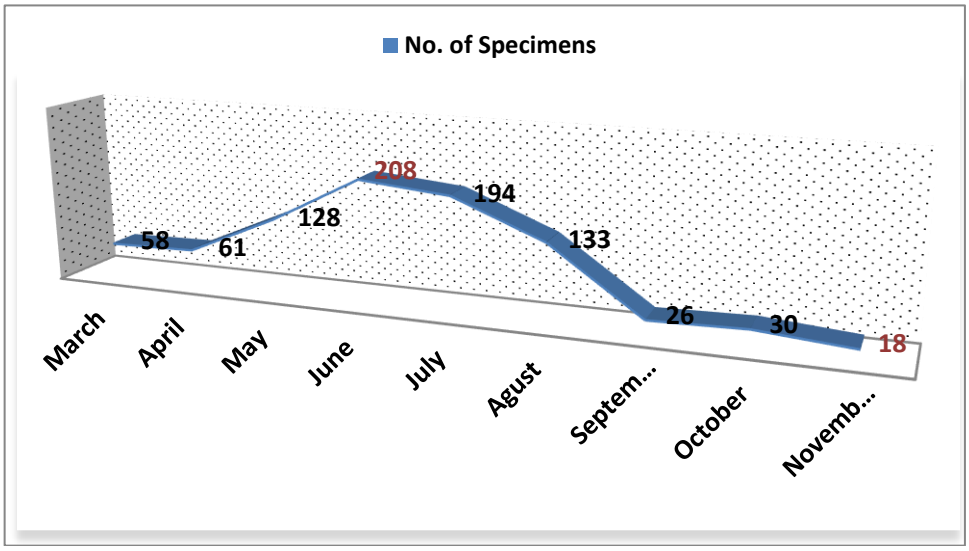
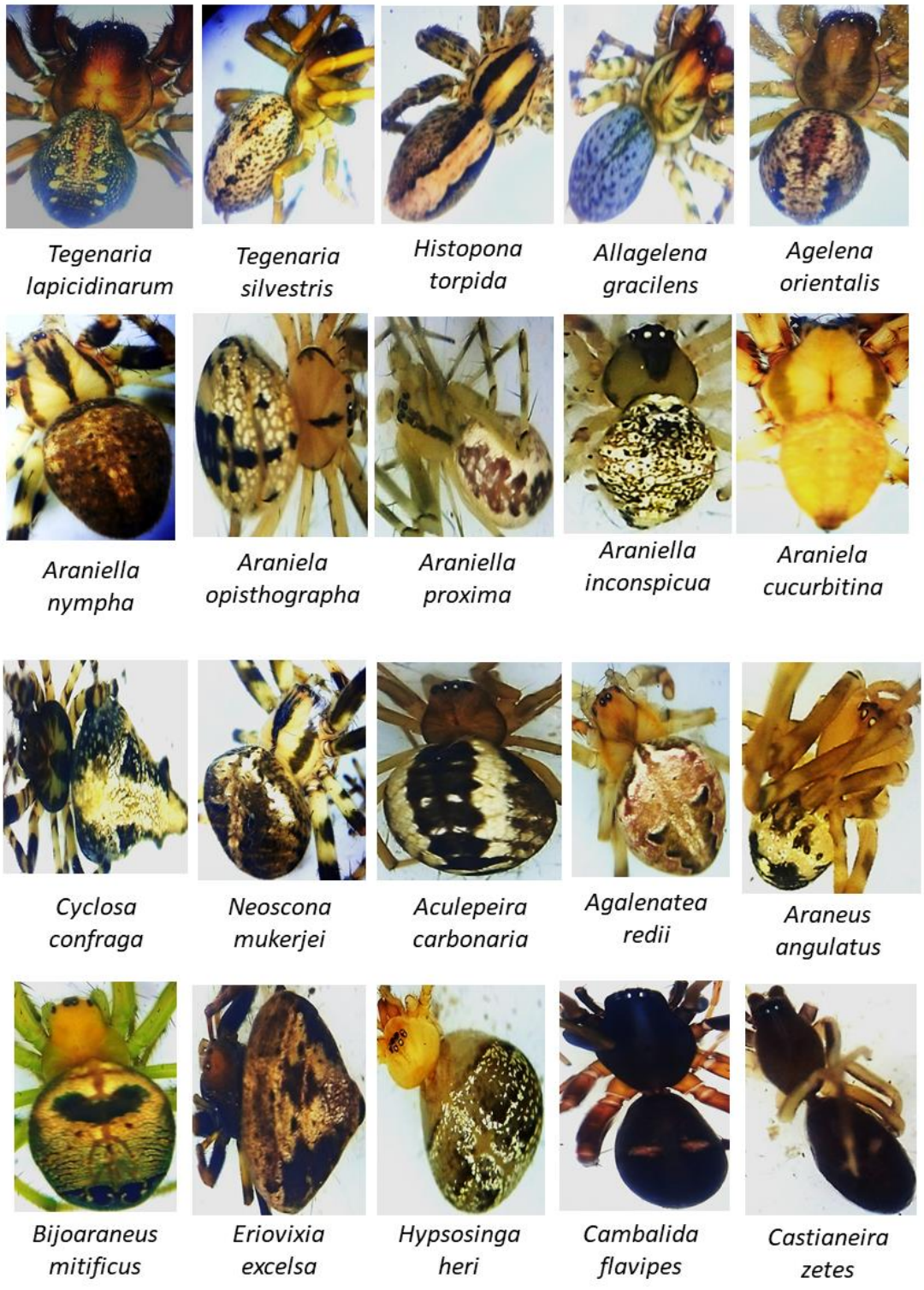


Figure 5: Monthly wise richness of Spiders Samples collected from District Battagram


Tegenaria lapicidinarum
Tegenaria silvestris
Histopona torpida
Allagelena gracilens
Agelena orientalis
Araniella nympha
Araniela opisthographa
Araniella proxima
Araniella inconspicua
Araniela cucurbitina
Cyclosa confraga
Neoscona mukerjei
Aculepeira carbonaria
Agalenatea redii
Araneus angulatus
Bijoaraneus mitificus
Eriovixia excelsa
Hypsosinga heri
Cambalida flavipes
Castianeira zetes


Parasyrisca schenkeli
Drassyllus lutetianus
Gnaphosa lucifuga
Gnaphosa leporina
Idiops Species
Lycosa bistriata
Lycosa chaperi
Lycosa kempi
Pardosa pullata
Pardosa bifasciata
Pardosa pseudoannulata
Pardosa pusiola
Hippasa holmerae
Evippa praelongipes
Pisaura mirabilis
Hasarius adansoni
Langona aperta
Plexippus paykulli
Plexippus clemens
Menemerus marginatus

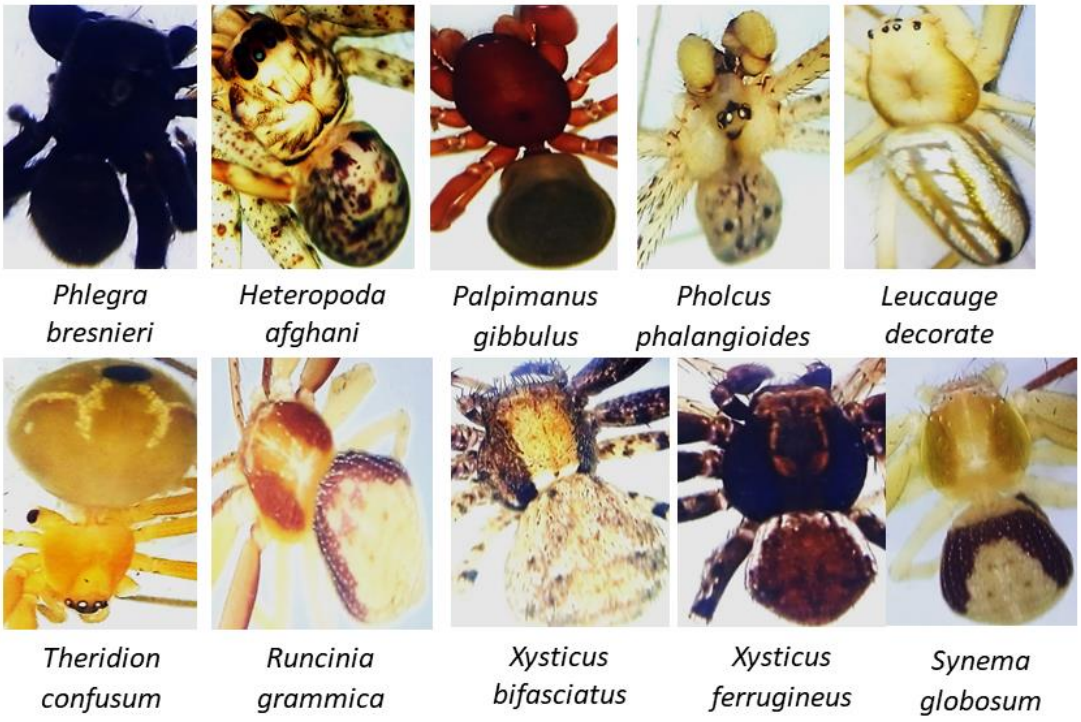


Figure: 6 Species diversity recorded from District Battagram

Conflict of Interest

There is no conflict of interest stated by the authors.

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