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DIVERSITY OF JUMPING SPIDERS (ARANEAE: SALTICIDAE) FROM SEMI-URBAN AREA OF DISTRICT UDHAMPUR, JK (UT), INDIA

Dr. Brinder Kumar[1]

[1]*Associate Professor, Department of Zoology, Govt. Gandhi Memorial Science College Jammu, JK (UT) India.*

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ABSTRACT

Salticidae or jumping spiders is the largest family of spiders in the Araneae order. They can be found in both human habitation and gardens, jumping spiders are common in terrestrial habitats and are well-known to people. Even though jumping spiders are a significant category of arthropods, little is known about their diversity, distribution, taxonomy, and behavior across different regions of India. Very limited studies were conducted on spider diversity from JK (UT), however only a few records exist of the salticid fauna of district Udhampur. Therefore, it was necessary to determine the diversity of jumping spiders found in the semi-urban area of district Udhampur. In the present study the jumping spiders of semi-urban area of district Udhampur was represented by 28 species in 17 genera. This appears to be just a small portion of the salticid fauna actually found in district Udhampur and further work is required to thoroughly understand the diversity and biology of this group.

KEYWORDS: *Salticidae, Jumping Spider, Udhampur, Semi-Urban, Menemerus*

INTRODUCTION

Spiders are one of the most pervasive group of arachnids. They are the most predominant predator of any terrestrial community (Gertsch, 1979; Turnbull, 1973). Spiders play a significant role in the life of every habitat including households (Gertsch, 1979). They feed on insects which are harmful to humans and their livestock (Tikader, 1987). Households' spider feeds on insects such as cockroaches, houseflies and mosquitos, which are carriers/vectors of pathogens that cause acute and chronic infections in humans (Gajbe, 2004). Unlike household insect pests, household spiders do not contaminate human food, spoil clothing or ruin homes (Savory, 1928).

There are currently 51,083 recognized spider species in the world (World Spider Catalogue 2023) and a small portion of this diversity can be found living in close vicinity to humans. Spiders present inside and around human habitations have been studied by some arachnologists (Cutler 2007; Smith *et al*., 2012; Rozwalka *et al*., 2017; Purgat *et al*., 2021; Pupin and Brescovit, 2023), however, more such studies need to be taken up. India represented 1977 spider species belonging to 514 genera and 63 families. (Caleb and Sankaran, 2025).

Several unrecorded or undiscovered species exist, particularly in northwestern India including Jammu and Kashmir, where just a few studies have been conducted. Some of these studies (Tikader and Bal, 1981; Zabka, 1981; Tikader, 1982a, 1982b; Gajbe 1988; Majumder and Tikader, 1991; Hormiga, 1994; Chakrabarti, 2013; Punjoo and Bhat, 2015; Shah and Buhroo, 2022; Singh *et al*., 2023; Zehbi and Yousuf, 2023) are highly significant and taxonomic in nature. With 646 genera and 6,231 species, the Salticidae family is the largest spider family in the world (World Spider Catalog, 2020). Because most of these species are highly active in warm weather, they often jump from leaves, bark, and twigs to find prey or to avoid potential predators. This makes them known as jumping spiders. They are energetic, hunting spiders that range in size from little to medium, and they can jump or leap far. The high diversity of jumping spiders can be explained by the combination of a variety of microhabitats within a site and the small spatial niches that are occupied by the majority of species. Additionally, because of their high number and conspicuousness in environments close to human settlement, jumping spiders are easy to locate. The present study aims to study and report the jumping spiders inhabiting semi-urban area from the district Udhampur and provide baseline pictorial illustrations for future studies

MATERIALS AND METHODS

Study area

The present study was conducted from April 2024 to March 2025 in the semi-urban area of district Udhampur of JK (UT), which is a part of the Northwest Lower Himalayas (Image 1). Udhampur district is situated in south eastern part of Jammu & Kashmir (UT) and is bounded in the west by Reasi district, in the north by Ramban district, in the north east by Doda district, in the south east by Kathua & Samba district and in south west by Jammu district. The district headquarter at Udhampur town lies between 32°34' & 39° 30' North latitudes and 74°16' & 75°38' East longitudes. Udhampur district cover an area of about 2380 sq. kms. This diverse range provides a unique habitat for various

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flora and fauna. Spiders prefer vegetation that provides ample cover, attachment points for webs, and a suitable microclimate. The major shrubs found in the study area like, *Adhatoda vesica, Vitex negundo, Berberis lycium, Woodfordia, Carissa opaca, Colebrookea oppositifolia, Dodonaea viscosa.* Major herbs including, *Anagallis arvensis, Fumaria indica, Taraxacum officinale, Stellaria media, Polygonum, Mirabilis jalapa,* and *Oenothera, Capsella.*

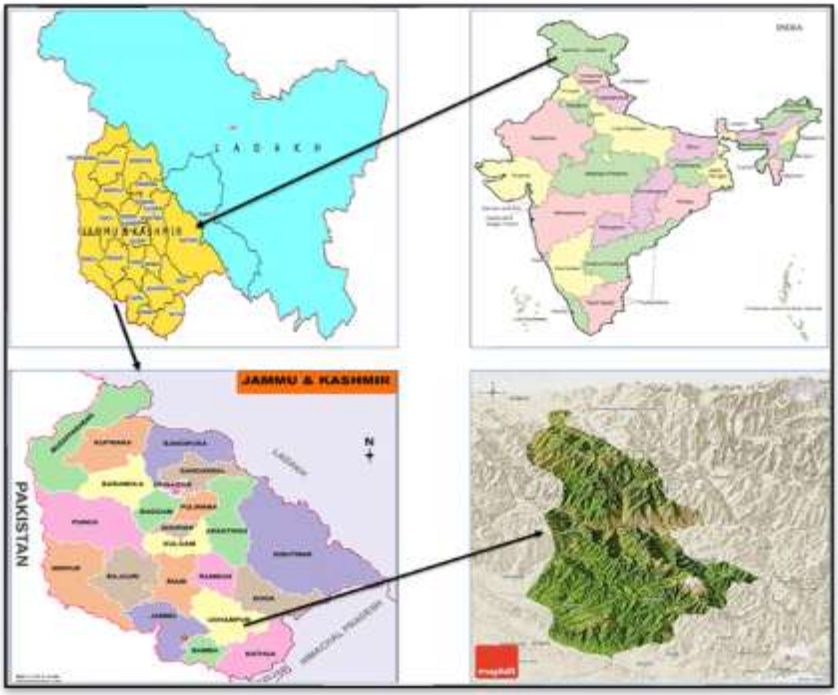


Image 1. Location of study sites in J&K (UT), India. (Kumar and Kaur, 2023)

METHODS

(a) Sampling

Three habitats namely Garden, shrub and human residential area were selected for this study. Five number of quadrats each with 50m X 50m was plotted in garden, shrub habitat and five number of houses/buildings was selected as sample location for recording the distribution of spider in different habitat in semi-urban area of district Udhampur. Survey was conducted in three consecutive days alternately for 10 days per month during morning (6.30-8.30am) and evening hours (3.30-5.30pm) between April 2024 and March, 2025. Species diversity indices were used to calculate the diversity of species found in the study area.

During survey, following four different techniques (Coddington et al., 1991; Toti et al., 2000) were used for locating spider in different habitats.

(i) **Aerial hand collection**: The spiders were searched from the knee height to the top of the vegetation cover and collected by a sweep net having diameter of 36 cm.

(ii) **Ground hand collection**: Spiders were searched on the surface of the ground, rock and plants below the knee level.

(iii) **Beat sheet method**: A light coloured cloth was kept under the vegetation and then the vegetation was shaken robustly to collect the spider.

(iv) **Household goods**: All the hideout areas inside the houses were thoroughly searched to locate the spider. Once spider was sighted, photographs were taken at the field site for species identification and then released immediately in the same habitat.

RESULTS AND DISCUSSION

A total of 28 species of spider belonging to family Salticidae were found during the survey period in semi-urban area of district Udhampur However, 3 species among them were not identified (Table 1, Image 2, 3, 4). Out of 28 species 10 (36%) constituted each in the garden and shrub habitat followed by 8 (28%) species were found from house/building (Fig-1). The species namely *Menemerus semilimbatus, Plexippus paykulli, Harmochirus brachiatus, Hasarius adansoni, Myrmarachne plataleoides, Myrmarachne melanocephala* and *Menemerus nigli* were found to be the dominant species in the study area. Analysis of data showed that out of 28 spider species sighted at the study area, 7 species were common, 5 species were frequent, 10 species were occasional and 6 species were rare (Fig-2).

Shannon-Wiener Diversity Index & Simpson's Diversity Index was analysed from the study area. H value of Shannon-Wiener Diversity Index ranged from 1.5-3.5 and only rarely exceeds 4.5, low value indicated low diversity and highest value indicate absolute (perfect) diversity. High species diversity (2.97) was found in the study area. Species richness (5.03) and species evenness (0.89) were also found highest in the study area (Table 2).

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A total of 284 species of spiders described under 160 genera belonging to 34 families were recorded in both the territories (Jammu and Kashmir, and Ladakh) of northwest India (Singh *et al*., 2023). Out of 20 districts of JK (UT), most of the valid species of spiders were recorded (143 species) from Srinagar followed by (88 species) Anantnag, (67 species) Ganderbal, Baramulla (51 species), Pulwama (47 species), Budgam (44 species), Jammu (37 species), Shopian (34 species) and Udhampur (15 species). Most of the work on spider fauna diversity has been conducted in the Kashmir division, with comparatively less research in the Jammu division. The work of Thakur *et al*. (1995) revealed the existence of 20 species of spiders belonging to12 genera under eight families in Jammu region. As per previous record 33 species of Salticidae family were recorded from Jammu and Kashmir (UT). Only 2 species namely *Cyrba algerina* and *Dendryphantes caporiaccoi* from family Salticidae were recorder from district Udhampur (Caporiacco, 1935). The majority of jumping spider species have been recorded from other districts of the Jammu and Kashmir UT (Singh *et al*., 2023). This study is the first systematic documentation of the jumping spider fauna in district Udhampur, providing insights into its biodiversity.

Due to a scarcity of research in the study area, the jumping spider records from district Udhampur are sketchy. Consequently, more field surveys are required in different habitats of the study area to have a true picture of the salticid fauna of district Udhampur. This work is significant as it provides an up-to-date number of Salticids species found in study area and adds to the arachnid biodiversity of the district Udhampur. This will help researchers in proper identification and study of the jumping spiders of district Udhampur, J&K (UT).

Table 1. Systematic list of Jumping spider species found in semi-urban area of district Udhampur, JK (UT).

S.No	Common Name	Zoological Name
1	Two-stripted Jumper spider	*Telamonia dimidiata* (Simon, 1899)
2	Adansons house jumper	*Hasarius adansoni* (Audouin, 1826)
3	Ant mimicking jumping spider	Myrmarachne melanocephala (MacLeay, 1839)
4	Ant-mimicking jumping spider	Myrmarachne plataleoides (Pickard- Cambridge, 1869)
5	Banded Phintella	Phintella vittata (C.L.Koch, 1846)
6	Phintella Jumping spider	Phintella piatensis (Barrion and Litsinger, 1995)
7	Boreal jumping spider	Bianor sp.
8	Common Housefly catcher	Plexippus petersi (Karsh, 1878)
9	Pantropical Jumping Spider	Plexippus paykulli (Audouin, 1826)
10	Hairy-armed Jumper	Harmochirus brachiatus (Thorell, 1877)
11	Half-edged Wall jumping spider	Menemerus semilimbatus (Hahn, 1829)
12	Wall jumping spider	Menemerus fulvus (L. Koch, 1878)
13	Gray wall jumper	Menemerus bivittatus (Dufour, 1831)
14	Heavy-bodied jumper	Hyllus sp.
15	Heavy-bodied jumper	Hyllus semicupreus (Simon, 1885)
16	Imperial Jumping spider	Thyene imperialis (Rossi, 1846)
17	White-jawed jumping spider	Hentzia sp1
18	Jumping spider	Hentzia sp2
19	Jumping spider	Menemerus nigli (Wesolowska & Freudenschuss, 2012)
20	Jumping Spider	Rhene albigera (C.L Koch, 1846)
21	Jumping Spider	Maevia sp.
22	Jumping spider	Rudakius ludhianaensis (Tikader, 1974)
23	Jumping spider	Marpissa lineata (CL Koch, 1846)
24	Jumping spider	Evarcha sp.
25	Jumping spider	Cyrba ocellata (Kroneberg, 1975)
26	Jumping spider	Unidentified sp.1
27	Jumping spider	Unidentified sp.2
28	Jumping spider	Unidentified sp.3

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Image 2. A-*Telamonia dimidiata* | B-*Hasarius adansoni* (♂) | *C- Hasarius adansoni* (♀) | *D-Myrmarachne melanocephala* | E-*Myrmarachne plataleoides* | F-*Phintella vittate* | G-Unidentified sp.1 | H-Unidentified sp.2 | I-Unidentified sp.3

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Image 3. A-*Phintella piatensis* | B-*Bianor sp* | C-*Plexippus petersi* | D-*Plexippus paykulli* (♂) | E-*Plexippus paykulli* (♀) | F-*Harmochirus brachiatus* | G-*Menemerus semilimbatus* | H-*Menemerus fulvus* | I-*Menemerus bivittatus* | J-*Hyllus sp* | K-*Hyllus semicupreus* | L-*Thyene imperialis* (♂).

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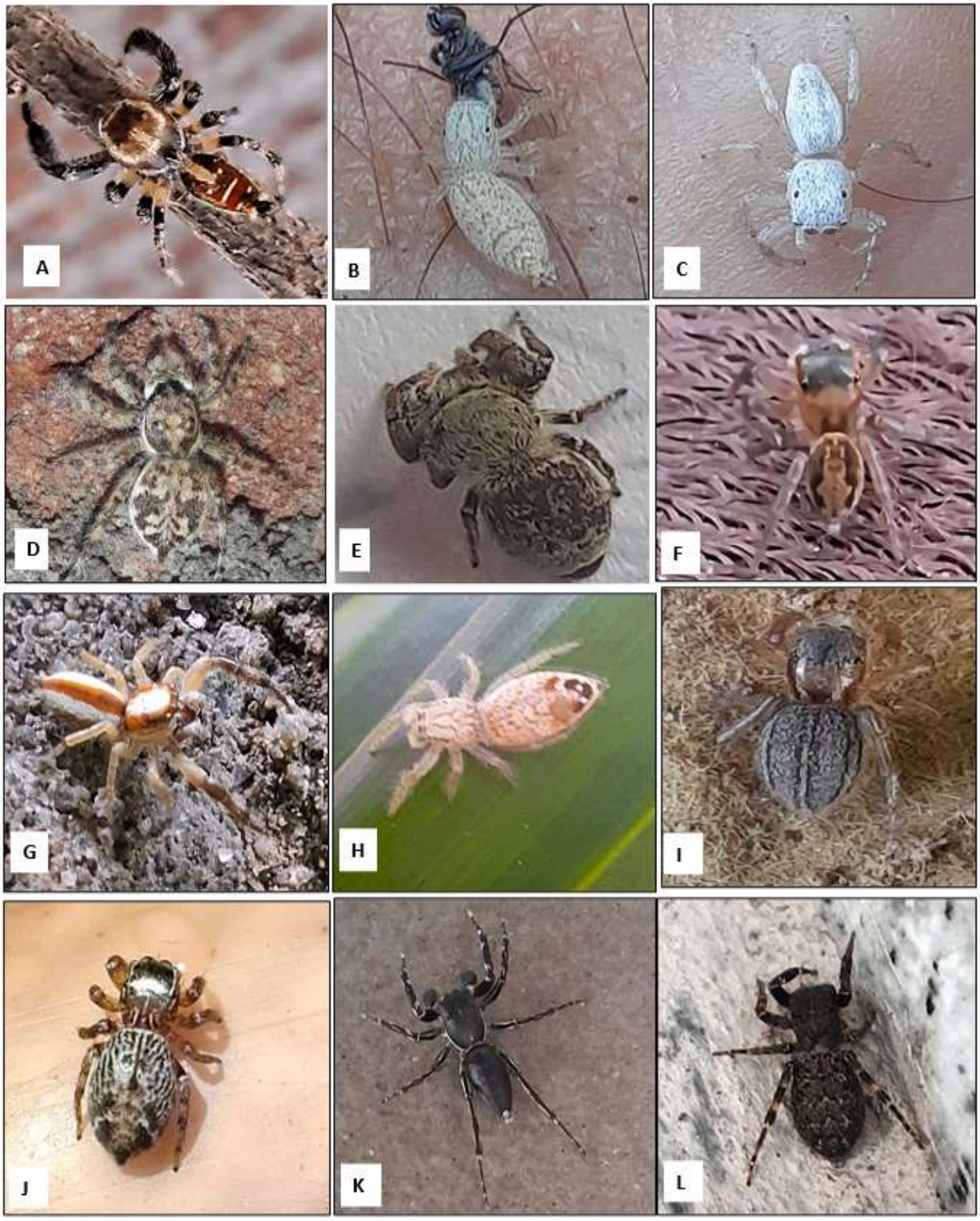


Image 4. A-*Thyene imperialis* (♂) | B-*Hentzia sp*1 | C- *Hentzia sp*2| D-*Menemerus nigli* | E-*Rhene albigera* | F-*Maevia sp*. | G-*Rudakius ludhianaensis* (♂) | H-*Rudakius ludhianaensis* (♀) | I- *Marpissa lineata* | J-*Evarcha sp* | K- *Cyrba ocellata* (♂) | L- *Cyrba ocellata* (♀).

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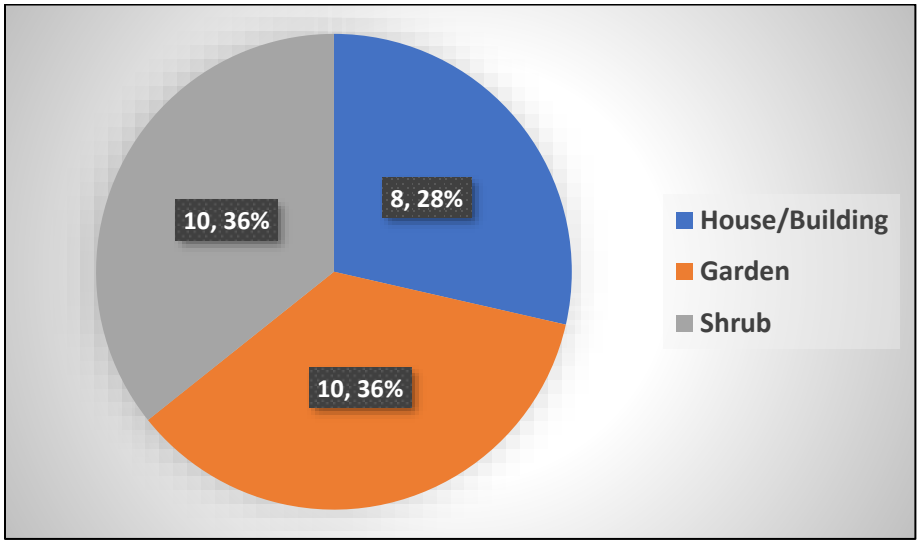


Figure 1. Pie chart represented the spider species found in different habitat of study area.

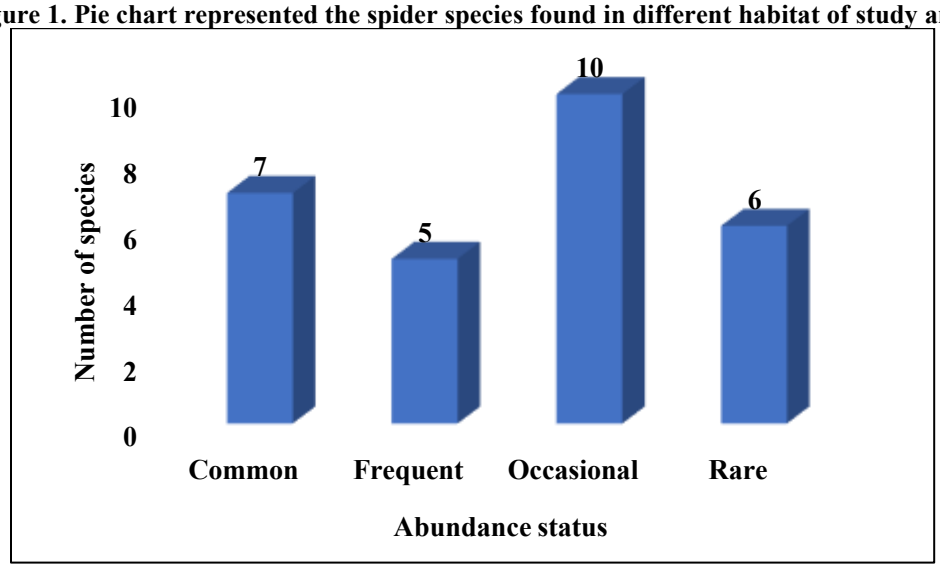


Figure 2. Bar Chart showing the abundance status of species in the study area.

Table 2. Shannon-Weiner diversity indices in the study area.

Shannon-Weiner Species Diversity Index	Margalef's Index	Pielou's Evenness Index (J)
2.97	5.03	0.89

CONCLUSION

The jumping spider fauna of semi-urban area of district Udhampur is represented by 28 species in 17 genera from different habitats. This was the first systematically study of spider fauna from the study area. There are diverse habitats found in the study area, the actual number of Salticids species found in the district Udhampur could be much more. considering their wide distribution and unique adaptations among arthropods, jumping spiders warrant greater research attention, particularly regarding their diversity, distribution, biology, behavior, and potential role in biocontrol.

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