

A faunistic study of the spiders in Department of Life Sciences campus, Bhavnagar City, Gujarat, India

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Abstract

Spiders represent the most extensive assemblage of organisms classified under the taxonomic Order *Araneae* within the biological Class *Arachnida*. These individuals are extensively distributed and can be found in various habitats. The primary objective of this study is to examine the faunal diversity of spiders within the Department of Life Sciences at Maharaja Krishnakumarsinhji Bhavnagar University, located in Bhavnagar, Gujarat. The assessment was conducted between the months of July 2022 to July 2023, focusing on specific areas of the site. The research area is situated at coordinates 21° 75 '58"N 72° 12' 90" E, with a total area of 12,691 square meters. The data was acquired through the process of observation and site visitation. A comprehensive survey conducted at Life Sciences Department in Bhavnagar, Gujarat, identified total 47 spider species, which were distributed into 39 genera and 15 families. Based on the screening of the survey, the conclusion risen out that the *Salticidae* family exhibits a total of 16 genera and 18 species, thereby representing the family with the greatest number of genera and Species ($H'=0.36$). The *Araneidae* family is ranked second having 7 genera with 10 species ($H'=0.32$). The study documented the primary taxa of *Salticidae*, a prominent family of jumping spiders, and then listed the taxa of *Araneidae*, a family comprising species of web spiders. The survey consists of a comprehensive faunal database documenting the spider species present at the study site.

Keywords: Abundance, spiders, diversity, identification keys

Introduction

Spiders are captivating organisms classified under the taxonomic class *Arachnida* within the phylum Arthropoda. The feeding habits of this species are primarily insectivorous, as documented by Patel (1985), who observed that they consume the bodily fluids of minute insects such as flies, moths, and other similar species. Spiders construct intricate silk webs in order to ensnare their prey. The majority of spiders possess venom, which they utilize to induce unconsciousness in their prey. Nevertheless, the venom it produces does not pose significant threat to human people. These organisms are categorized as members of the class *Arachnida* based on their possession of eight eyes and eight appendages. The structure of the body of spiders consists of two main parts, namely the cephalothorax and the abdomen, as described in the book "Spiders of India" by Sebastian and Peter. Spiders are commonly observed in most ecosystems, with the exception of marine environments and Polar Regions.

Spiders exhibit a wide distribution, spanning diverse habitats ranging from cultivated rural areas to developed metropolitan areas. They can be found in various climatic regions, including temperate zones such as deserts and moist forests, as well as in different types of forests, including dry deciduous forests and evergreen forests. The species in question is primarily observed in arboreal habitats, as well as behind stones, within crevices of walls, fallow lands, abandoned structures, domestic dwellings, uninhabited regions, and wetland environments (S. Patel, 1985). The study site exhibits a hot and semi-arid climate. The ecosystem is comprised of densely populated shrubland. In the winter season, there is a significant decrease in temperature, reaching as low as 20°C. Conversely, during the summer months, there is a substantial increase in temperature, reaching as high as 46°C.

During the monsoon season, the climate tends to exhibit high humidity. According to the World Spider Catalog version 24.5, The global distribution of 51,361 species, Belonging to 4,334 genera and 135 families. During the period of observation in India, a total of 1954 species, classified into 495 genera and 61 families, were documented according to the World Spider Catalog version 24. A total of 415 spider species, distributed among 169 taxa and 40 families, were observed in the state of Gujarat, as reported by Archana Yadav *et al* in 2017^[3].

Materials and Methods

Study Site

The data was obtained from the Department of Life Sciences at Bhavnagar, Gujarat. The study site covers an area of 12,691 square meters and is located at coordinates 21°75'58" N 72°12'90" E. The region is characterized by undulating terrain, abundant shrubbery, trees, and grassland, and features a centrally located pond.

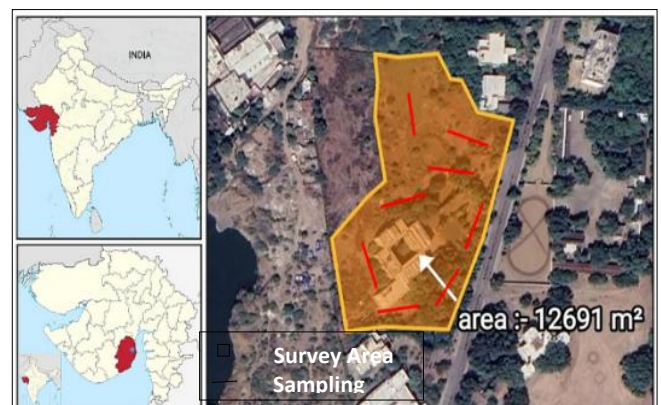


Fig 1: Sampling Area



Fig 2: Habitat in different Season in Study Site

Methodology

The identification of all spider species was conducted through active visual searching, as documented by S. R. Markad in 2020. Active visual searching was conducted in 240m sampling track which grouped in 8 paths. Each path was about 30m long in addition, a ground search was conducted to locate spiders that were present at ground level (Jayaraman Dharmaraj et.al, 2017). The site was monitored for approximately 4 hours per week during defined study periods and total 48 visit. The plant beating method, also known as shaking of trees, is employed to gather spiders (S. R. Markad, 2020). The desiccated bark was removed to facilitate further examination. The rocks were elevated to gather the concealed spiders beneath them. Juvenile, diminutive arachnids and agile arachnids were manually collected from the ground, trees, man-made structures, and arid shrub land, and then placed into vials. The physical traits were documented in their native environment to the fullest extent possible.

Identification and Photography

The spiders contained in the vials were analyzed using a Stereomicroscope (stemi 305). The spiders were identified

based on their documented physical traits and pictures. The images were promptly captured using a Redmi Note 10 Pro Max macro camera in the creatures' natural environments. The spiders were identified using GBIF (the global biodiversity information facility), ZSI (zoological survey of india), iNaturalist site, Research article and paper, Wikipedia, "Spiders of India" by P. A. Sebastian and K. V. Peter, and "Handbook of Indian Spiders" by B. K. Tikader (1987) [12]. Following the investigation, the kept spiders were reintroduced into their native habitat.

**Statistical Analysis Method
Shannon-Wiener Diversity Index**

$$H' = - \sum_{i=1}^s pi \ln(pi)$$

Where

H' = Diversity Index

S = Number of Species

Pi = The Proportion of Individuals found in ith Species

ln = The Natural Logarithm

Result and Discussion

A total of 47 spider species were detected in an overall area of 12,691 square meters at the Life Sciences Department. All species were classified into 39 genera and 15 families. The survey analysis reveals that the *Salticidae* family comprises a total of 16 genera and 18 species, making it the family with the highest number of genera and species ($H'=0.36$). The Araneidae family is the second largest family, consisting of 7 genera and 10 species ($H'=0.32$), indicates a moderate level of species richness. The Oxyopidae family ranked third with 1 genus and 4 species ($H'=0.209$) (Table-1). Family *Thomisidae* and family *Lycosidae* comprises of 3 and 2 genera respectively ($H'=0.175$) (Table-1). The recorded species of genus *Poltys* and *Argiope* belonging to family Araneidae and species of genus *Scytodes* from family Scytodidae are unidentified. Among all genera, genus *Oxyopes* has the highest grade in species (Fig: 4). The genus *Argiope* is ranked second with 3 species (Fig: 4). Among all species 39% species belonged to family *Salticidae*, 20% species belonged to family Araneidae and 8% species are from Oxyopidae. During the survey period, the highest specimens were noted which belonged to family *Salticidae* (Table-1). Which indicates richness of family. On the other hand, only 2 individuals of family Tetragnathidae were recorded indicating low abundance of family (Table-1).

Guizygiella melanocronia (2 individuals) show very low abundance (Fig: 5). *Menemerus nigli* has average abundance as the number of recorded individuals is 27 (Fig: 6). The *Theridion manjithar* shows the highest occurrence in the survey area as the total 54 individuals were collected (Fig: 7). Total 38 individuals of *Menemerus bivittatus* and *Uloborus plumipes* were noted during survey period which ranked second highest (Fig: 7). During the study time total 792 individuals of all species were recorded (Table-1). The '+' sign indicates the compactness of species (Table-4). The highly dense species shown with '++++' where the low dense species shown with '+' (Table-4). The highest abundance of species were noted during the September month (Fig: 8). In September total 86 individuals of all species were recorded. While in May only 35 individuals of species were observed which shows low abundance of species (Fig: 8). During Winter season total 121 individuals of family *Salticidae* were recorded, while individuals of *Lycosidae*, *Tetragnathidae* and *Scytodidae* Families were not found in Winter (Fig: 9). In Summer, the highest abundance of family *Salticidae* were observed while family *Thomisidae* showed very low abundance (Fig: 9). In Monsoon, 152 individuals of family *Salticidae* were recorded (Fig: 9). *Tetragnathidae* and *Scytodidae* families were restricted to the Monsoon season (Fig: 9).

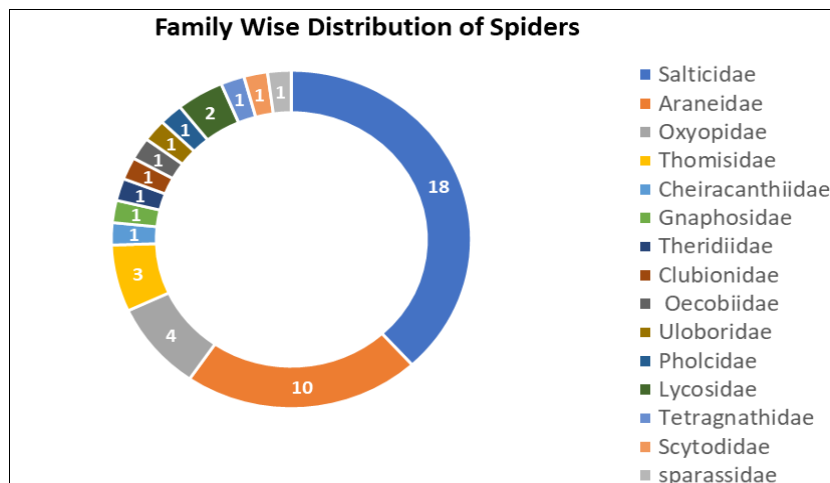


Fig 3: Chart Showing the Percentage of Species Represented by Different Families

Table 1: Family-wise Configuration of Spider group in Study site

Sr.No.	Family	Genus	Species	No. of Individuals			
				Winter	Summer	Monsoon	Total
1	<i>Salticidae</i>	16	18	121	62	152	335
2	Araneidae	7	10	53	17	41	111
3	Oxyopidae	1	4	26	27	18	71
4	<i>Thomisidae</i>	3	3	15	1	15	31
5	Cheiracanthiidae	1	1	4		2	7
6	Gnaphosidae	1	1	2	7	3	12
7	Theridiidae	1	1	15	23	16	54
8	Clubionidae	1	1		2	3	5
9	Oecobiidae	1	1	13	6	6	25
10	Uloboridae	1	1	13	10	15	38
11	Pholcidae	1	1	12	12	11	35
12	Lycosidae	2	2		27	16	43
13	Tetragnathidae	1	1			2	2
14	Scytodidae	1	1			5	5
15	Sparassidae	1	1	9	5	4	18
	Total	39	47				792

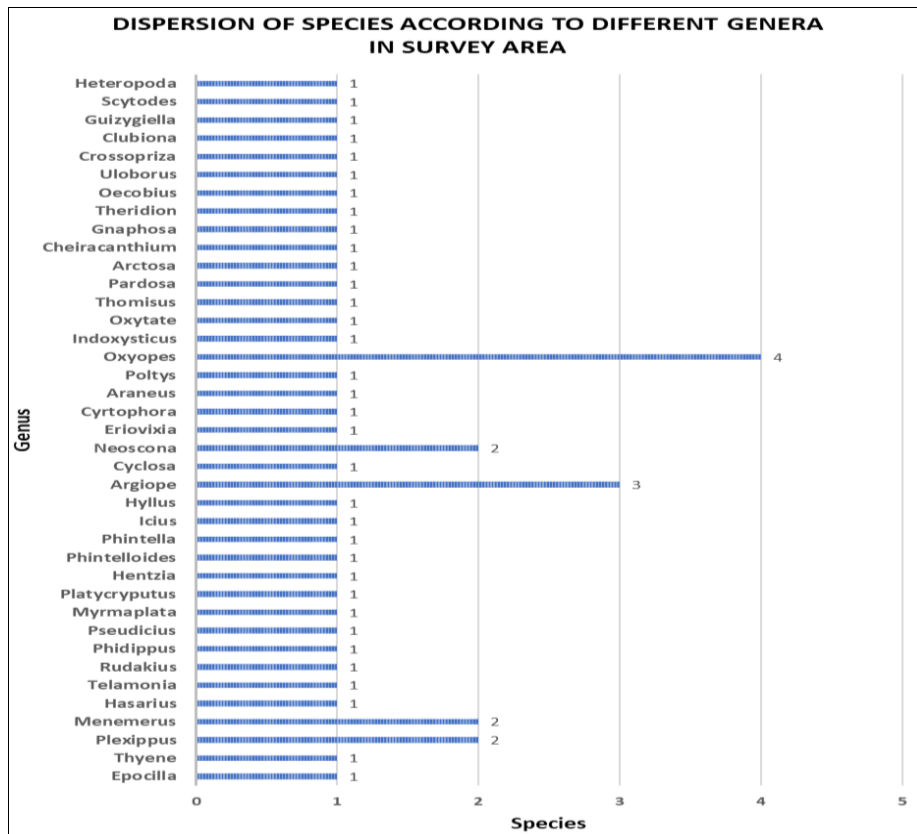


Fig 4: Dispersion of Species according to different Genera in Survey Area

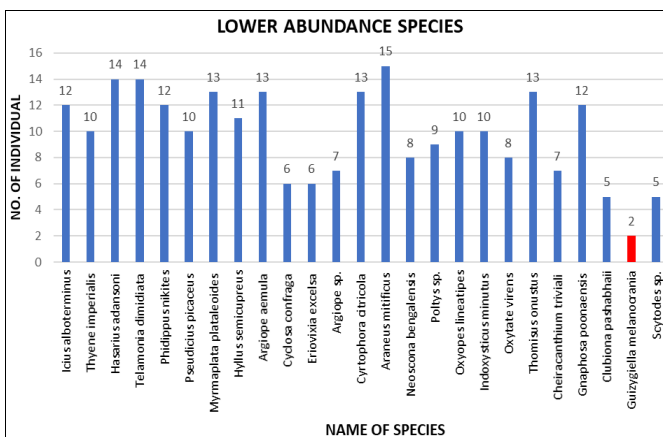


Fig 5: Species Showing Low Abundance

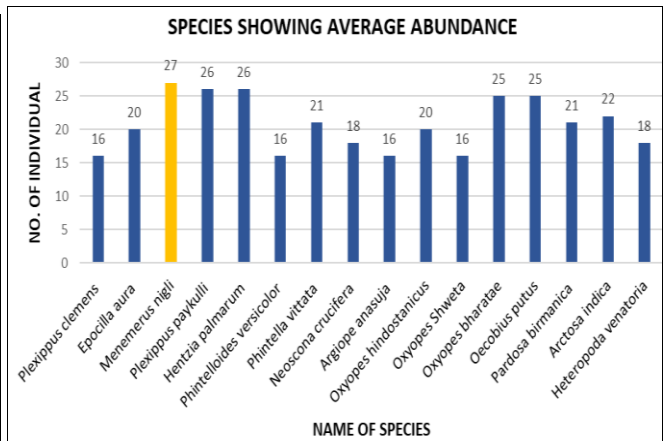


Fig 6: Species showing Average Abundance

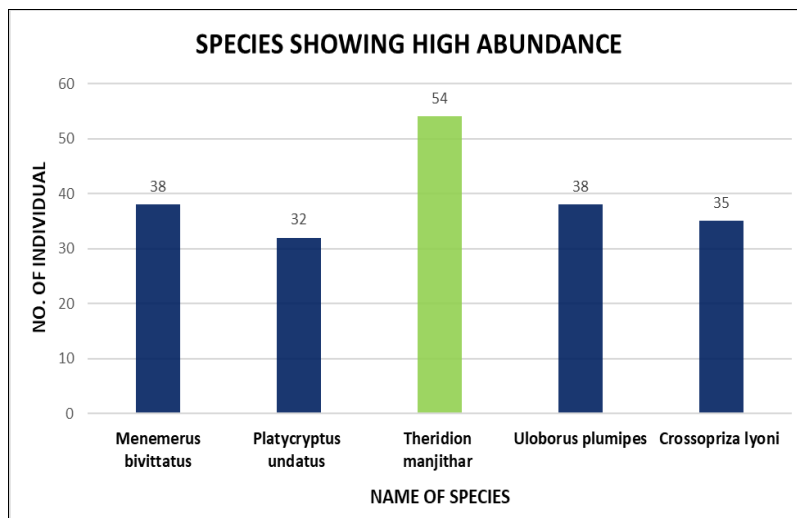


Fig 7: Species showing High Abundance

Table 2: Family-wise Species checklist of Spiders with Past Occurrence in study site

Sr.No.	Scientific Name	Past occurrence	Reference
Family: Salticidae			
1	<i>Icius alboterminus</i> (caleb, 2014)	Patan, Gujarat	Subhash Parmar et.al.,,2023
2	<i>Thyene imperialis</i> (Rossi, 1846)	Rajkot, Gujarat	Jyotil K. Dave et.al., ,2024
3	<i>Plexippus Clemens</i> (O. Pickard-Cambrige)	Patan, Gujarat	Subhash Parmar et.al.,2023
4	<i>Epocilla aura</i> (Dyal, 1935)	Gujarat.	John T.D. Caleb et.al., (2021)
5	<i>Menemerus nigli</i> (Wesolowska & Freudenschuss, 2012)	Rajkot, Gujarat	Jyotil K Dave et.al.2024
6	<i>Menemerus bivittatus</i> (Dufour, 1831)	Gujarat.	J.N. Prajapati et.al.,2018
7	<i>Plexippus paykulli</i> (Audouin, 1826)	Gujarat.	Archana Yadav et.al.,2017 ^[3]
8	<i>Hasarius adansoni</i> (Audouin, 1826)	Gujarat.	Archana Yadav et.al.,2017 ^[3]
9	<i>Telamonia dimidiata</i> (Simon, 1899)	Gujarat.	Archana Yadav et.al.,2017 ^[3]
10	<i>Rudakius ludhianaensis</i> (Tikader, 1974)	Patan, Gujarat	subhash Parmar et.al.,2023
11	<i>Phidippus nikites</i> (Chamberlin & Lvie, 1935)	Bhavnagar, Gujarat	S.K. Patel et.al.,1985
12	<i>Pseudicius picaceus</i> (Simon, 1868)	Madurai, Tamilnadu	Thirukonda R Gayathri et.al.,2022 ^[22]
13	<i>Myrmaplata platalaeoides</i> (O. Pickard-Cambrige, 1869)	West Tripura	Animesh Dey et.al.,2013 ^[5]
14	<i>Platycryptus undatus</i> (Degeer, 1778)	Karnataka	Rajendra Singh et.al.,2021 ^[19, 23]
15	<i>Hentzia palmarum</i> (Hentz, 1832)	Karnataka	Tabasum et.al.,2018
16	<i>Phintelloides versicolor</i> (Kanesharatnam & Benjamin, 2019)	West Tripura	Animesh Dey et.al.,2013 ^[5]
17	<i>Phintella vittate</i> (C.L. Koch, 1846)	Patan, Gujarat	Subhash Parmar et.al.,2023
18	<i>Hyllus semicupreus</i> (Simon, 1885)	Gujarat.	Archana Yadav et.al.,2017 ^[3]
Family: Araneidae			
19	<i>Argiope amoena</i> (Karsch, 1878)	Bhavnagar, Gujarat	S.K. Patel et.al.,1985
20	<i>Cyclosa confragra</i> (Thorell,1892)	Pavagadh, Gujarat	Archana Yadav et.al.,2017 ^[3]
21	<i>Neoscona crucifera</i> (Lucus, 1839)	Western Ghat, Wayanad Region	Sruti Rajeevan et.al.,2019
22	<i>Eriovixia excelsa</i> (Simon, 1889)	Gujarat.	Archana Yadav et.al.,2017 ^[3]
23	<i>Argiope anasuja</i> (Thorell, 1887)	Gujarat.	J.N. Prajapati et.al.,2018
24	<i>Argiope sp.</i>	Navsari, Gujarat	J.N. Prajapati et.al.,2018
25	<i>Cyrtophora citricola</i> (Forskal, 1775)	Gujarat.	Archana Yadav et.al.,2017 ^[3]
26	<i>Araneus mitificus</i> (Simon,1886)	Patan, Gujarat	Subhash Parmar et.al.,2023
27	<i>Neoscona bengalensis</i> (Tikader and Bal,1981))	Navsari, Gujarat	J.N. Prajapati et.al.,2018
28	<i>Poltys sp.</i>	Anand, Gujarat	Jigar Patel et.al.,2023 ^[16]
Family: Oxyopidae			
29	<i>Oxyopes hindostanicus</i> (pocock, 1901)	Bhavnagar, Gujarat	S.K. Patel et.al.,1985
30	<i>Oxyopes shwets</i> (Tikader,1970)	bhavnagar, Gujarat	B.H. Patel et.al.,1986
31	<i>Oxyopes lineatipes</i> (C.L. Koch, 1847)	Bangalore	Selifa Fernandes et.al.,2020
32	<i>Oxyopes bharatea</i> (Gajbe, 1999)	Gujarat.	Archana Yadav et.al.,2017 ^[3]
Family: Thomisidae			
33	<i>Indoxysticus minutus</i> (Tikader, 1960)	Gujarat.	Archana Yadav et.al.,2017 ^[3]
34	<i>Oxytate virens</i> (Thorell, 1891)	Patan, Gujarat	B.M. Parmar et.al.,2015
35	<i>Thomisus onustus</i> (Walckenaer, 1805) ^[1]	Patan, Gujarat	Subhash Parmar et.al.,2023
Family: Lycosidae			
36	<i>Pardosa birmanica</i> (Simon, 1884)	Patan, Gujarat	B.M. Parmar et.al.,2015
37	<i>Arctosa indica</i> (Tikader & Malhotra,1980)	Bhavnagar, Gujarat	S.K. Patel et.al.,1985
Family: Cheiracanthiidae			
38	<i>Cheiracanthium triviale</i> (Thorell, 1895)	Pavagadh, Gujarat	Archana Yadav et.al.,2017 ^[3]
Family: Gnaphosidae			
39	<i>Gnaphosa poonaensis</i> (Tikader,1973)	Pavagadh, Gujarat	Archana Yadav et.al.,2017 ^[3]
Family: Theridiidae			
40	<i>Theridion manjithar</i> (Tikader,1970)	Bhavnagar, Gujarat	B.H. Patel et.al.,1986
Family: Oecobiidae			
41	<i>Oecobius putus</i> (O. Pickard-Cambridge,1876)	Junagadh, Gujarat	Namrata K. Hun et.al.,2023 ^[17]
Family: Uloboridae			
42	<i>Uloborus plumipes</i> (Lucas, 1846)	Vallabh vidhyangar, Gujarat	B.M. Parmar et.al.,2015
Family: Pholcidae			
43	<i>Crossopriza lyoni</i> (Blackwall, 1867)	Anand, Gujarat	Jigar Patel et.al.,2023 ^[16]
Family: Clubionidae			
44	<i>Clubiona pashabhahi</i> (Patel & Patel, 1973)	Pavagadh, Gujarat	archana Yadav et.al.,2017 ^[3]
Family: Tetragnathidae			
45	<i>Guizygiella melanocrania</i> (Thorell, 1887)	Gujarat.	Archana Yadav et.al.,2017 ^[3]
Family: Scytodidae			
46	<i>Scytodes sp.</i>	-	-
Family: sparassidae			
47	<i>Heteropoda venatiria</i> (Linnaeus, 1767)	Pavagadh, Gujarat	Archana Yadav et.al.,2017 ^[3]

Table 3: Monthly distribution of Individual in family

Family	july	august	september	october	november	december	january	feruary	march	april	may	june
<i>Salticidae</i>	12	27	45	40	40	36	31	28	26	20	12	18
<i>Araneidae</i>	4	3	15	10	13	19	13	15	6	5	5	3
<i>Oxyopidae</i>	13	8	7	1	2	7	6	8	5	1	5	8
<i>Thomisidae</i>			1	6	8	5	6	2	2	1		
<i>Cheiracanthiidae</i>					2	1	2	1	1			
<i>Gnaphosidae</i>	2	1	2						2	1	1	3
<i>Theridiidae</i>	7	3	3	7	3	4	3	5	3	7	3	6
<i>Clubionidae</i>		2		1						1	1	
<i>Oecobiidae</i>	1	2	3		1	1	4	5	3	3	1	1
<i>Uloboridae</i>	2	4	3	4	4	2	4	5	2	3	1	4
<i>Pholcidae</i>	2	3	2	4	2	3	3	4	2	3	3	4
<i>Lycosidae</i>	27	16										
<i>Tetragnathidae</i>			2									
<i>Scytodidae</i>			3	2								
<i>Sparassidae</i>	2	1			3	2	2	1	4		3	
Total	72	70	86	75	78	80	74	74	56	45	35	47

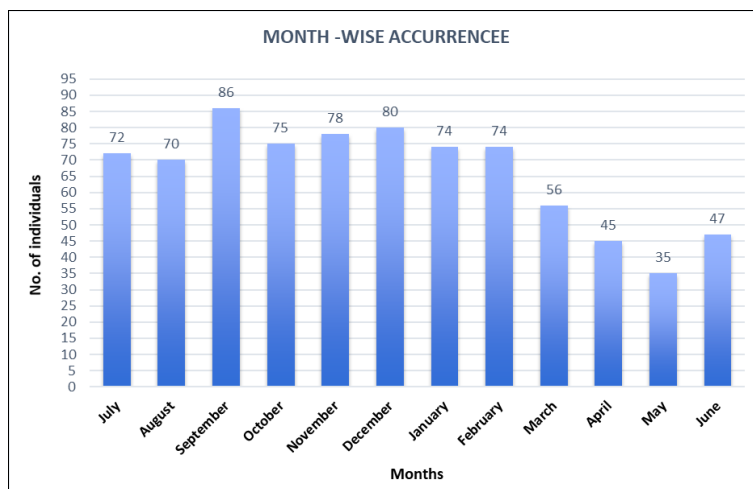


Fig 8: Month-wise occurrence of Species

Table 4: Species Diversity Checklist with Seasonal Abundance

Family	No	Scientific Name	Status	Winter	Summer	Monsoon
<i>Salticidae</i>	1	<i>Icius alboterminus</i>	+	√	√	
	2	<i>Thyene imperialis</i>	+	√	√	√
	3	<i>Plexippus clemens</i>	++	√	√	
	4	<i>Epocilla aura</i>	++	√	√	√
	5	<i>Menemerus nigli</i>	++	√	√	√
	6	<i>Menemerus bivittatus</i>	+++	√	√	√
	7	<i>Plexippus paykulli</i>	++	√	√	√
	8	<i>Hasarius adansoni</i>	+	√	√	√
	9	<i>Telamonia dimidiata</i>	+	√	√	√
	10	<i>Rudakius ludhianaensis</i>	+	√	√	√
	11	<i>Phidippus nikites</i>	+	√	√	√
	12	<i>Pseudicius picaceus</i>	+	√	√	√
	13	<i>Myrmaplata plataleoides</i>	+	√	√	
	14	<i>Platycryptus undatus</i>	+++	√	√	√
	15	<i>Hentzia palmarum</i>	++	√	√	√
	16	<i>Phintelloides versicolor</i>	++	√	√	√
	17	<i>Phintella vittata</i>	++	√	√	√
	18	<i>Hyllus semicupreus</i>	+		√	
<i>Araneidae</i>	1	<i>Argiope aemula</i>	+	√	√	
	2	<i>Cyclosa confragra</i>	+	√	√	
	3	<i>Neoscona crucifera</i>	++	√	√	√
	4	<i>Eriovixia excelsa</i>	+	√		√
	5	<i>Argiope anasuja</i>	++	√	√	
	6	<i>Argiope sp.</i>	+	√	√	
	7	<i>Cyrtophora citricola</i>	+	√	√	√

	8	Araneus mitificus	+	√		√
	9	Neoscona bengalensis	+	√	√	√
	10	Poltys sp.	+	√	√	
Oxyopidae	1	Oxyopes hindostanicus	++	√	√	√
	2	Oxyopes Shweta	++	√	√	√
	3	Oxyopes lineatipes	+	√		√
	4	Oxyopes bharaetae	++		√	√
Thomisidae	1	Indoxysticus minutus	+	√	√	
	2	Oxytate virens	+	√	√	√
	3	Thomisus onustus	+	√	√	
Cheiracanthiidae	1	Cheiracanthium triviale	+	√	√	
Gnaphosidae	1	Gnaphosa poonaensis	+	√	√	√
Theridiidae	1	Theridion manjithar	++++	√	√	√
Clubiona	1	Clubiona pashabhahi	+		√	√
Oecobiidae	1	Oecobius putus	++	√	√	√
Uloboridae	1	Uloborus plumipes	+++	√	√	√
Pholcidae	1	Crossopriza lyoni	+++	√	√	√
Lycosidae	1	Pardosa birmanica	++		√	√
	2	Arctosa indica	++		√	√
Tetragnathidae	1	Guizygiella melanocrania	+		√	
Scytodidae	1	Scytodes sp.	+		√	
Sparassidae	1	Heteropoda venatoria	++	√	√	√

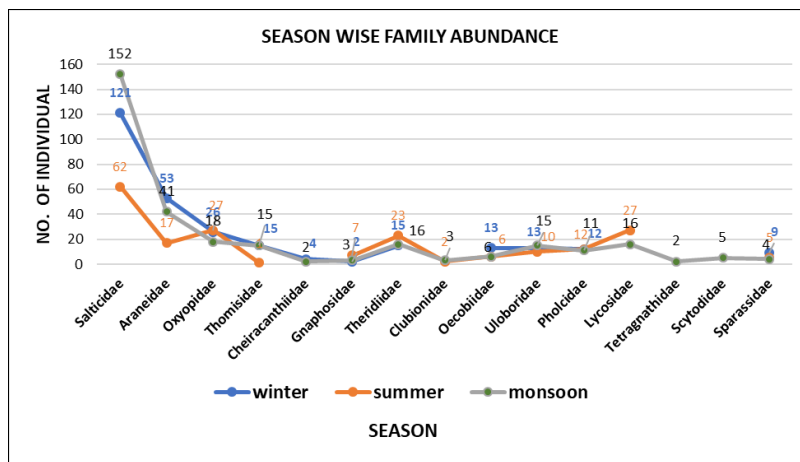


Fig 9: Season-wise Distribution of Family

Morphological Charectors

Family: Salticidae

1. Plexippus clemens (O. Pickard-Cambrige)

Common name: Jumping Spider

Family: Salticidae

Genus: Plexippus

Status: Common

Identification keys: Male possess dark brown carapace hooded with white hairs, Black Cephalic region have small patch of white hairs.

2. Epocilla aura (Dyal.1935)

Common name: Jumping Spider

Family: Salticidae

Genus: Epocilla

Status: Common

Identification keys: The Cephalothorax has a wide white section encircled by orange bands on the sides, while the abdomen is lengthy and has thin orange bands on the sides that create a distinct pattern on the upper surface. The legs are partially transparent.

3. Rudakius ludhianaensis (Tikader, 1974)

Common name: Jumping Spider

Family: Salticidae

Genus: Rudakius

Status: Rare

Identification keys: Male is smaller than Female having middle white band surrounded by brown band in Cephalic region, while female is pale in colour having alternative horizontal orange spotted bands and white bands, posterior end possess a black patch with two white dots in female.

4. Hasarius adansoni (Audouin, 1826)

Common name: Adanson's House Jumper

Family: Salticidae

Genus: Hasarius

Status: Rare

Identification keys: The body is predominantly black, with a white 'U' shaped band located at the back of the cephalothorax, the front of the abdomen, and on the upper surface of the pedipalp. Additionally, the abdomen bearing two white dots.

5. Hentzia palmarum (Hentz, 1832)

Common name: Common Hentz Jumper

Family: Salticidae

Genus: Hentzia

Status: Common

Identification keys: The cephalothorax and abdomen exhibit a dark brown coloration, while the lateral sides of

both are white. The first pair of legs is notably longer, and the pedipalps also have a white hue. The first pair of legs is black, while the remaining legs are a pale brown. In females, the overall coloration is pale brown, with dark brown patches present on the abdomen.

6. *Hyllus semicupreus*

Common name: Semi- Coppered Heavy Jumper

Family: Salticidae

Genus: *Hyllus*

Status: Rare

Identification keys: The male's body is black with a coppery hue, while the abdomen is brownish and tapers toward the rear. with contrast, the female has a light brownish color and is covered with abundant hair.

7. *Menemerus bivittatus* (Dufour, 1831)

Common name: Gray Wall Jumper

Family: Salticidae

Genus: *Menemerus*

Status: Common

Identification keys: The body is grey in colour having black bands on legs and on the lateral side of the body.

8. *Menemerus nigli* (Wesolowska & Freudenschuss, 2012)

Common name: Jumping Spider

Family: Salticidae

Genus: *Menemerus*

Status: Common

Identification keys: The body is creamish brown with black bands on the legs and a 'U' shaped white band at the posterior end of the cephalothorax. The pedipalps are covered in white hairs and there are blackish brown patches on the body.

9. *Phintella vittata* (C L Koch,1846)

Common name: Electric blue jumper

Family: Salticidae

Genus: *Phintella*

Status: Common

Identification keys: Cephalothorax and Abdomen region have silver and black parallel bands, The Abdomen is tapering posteriorly, at posterior end has one orange band.

10. *Myrmaplata plataleoides* (O. Pickard- Cambridge, 1869)

Common name: Red Weaver-Ant Mimicking Jumper

Family: Salticidae

Genus: *Myrmaplata*

Status: Rare

Identification keys: The creature resembles an ant, with a restricted body that is dark brown to black in color. It has long pedipalps with bulbous anterior ends.

11. *Phidippus nikites* (Chamberlin & Lvie, 1935)

Common name: Jumping Spider

Family: Salticidae

Genus: *Phidippus*

Status: Rare

Identification keys: The cephalothorax and abdomen exhibit an orange coloration, adorned with tiny hairs. The legs possess an orange translucent appearance. At the posterior end of the abdomen, there are four black patches,

which are divided by two horizontal bands and one middle longitudinal band of a creamish brown hue.

12. *Phintelloides versicolor* (Kanesharatnam & Benjamin, 2019)

Common name: Jumping Spider

Family: Salticidae

Genus: *Phintelloides*

Status: Rare

Identification keys: The The cephalothorax has a white spot in the center and a horizontal white band at the front, along with a 'U' shaped line at the back. The abdomen is slim and features two yellow bands on each side, encircling a central black band.

13. *Platycryptus undatus* (Degeer, 1778)

Common name: Tan or Familiar Jumping Spider

Family: Salticidae

Genus: *Platycryptus*

Status: Common

Identification keys: The body is brownish in colour, on the abdomen an arrow shaped brown patches surrounded by black bands.

14. *Plexippus paykulli* (Audouin, 1826)

Common name: Pantropical Jumping Spider

Family: Salticidae

Genus: *Plexippus*

Status: Common

Identification keys: The body is blackish brown in colour with white band in the middle surrounded by black bands.

15. *Pseudicius picaceus* (Simon, 1868)

Common name: Jumping Spider

Family: Salticidae

Genus: *Pseudicius*

Status: Rare

Identification keys: The cephalothorax exhibits triangular-shaped stripes encircled by a black band. The carapace exhibits white margins, while the abdomen is elongated and features a central black band flanked by white bands on both sides. The first pair of legs is notably larger and black in color. Padipals are adorned with white hairs. The female Padipal is predominantly gray with orange spots.

16. *Telamonia dimidiata* (Simon, 1899)

Common name: Two -Striped Jumping Spider

Family: Salticidae

Genus: *Telamonia*

Status: Rare

Identification keys: The female exhibits a lime yellow hue with reddish orange rings encircling the eyes and two reddish orange stripes on a white abdomen. In contrast, the males have a dark coloration, including a lengthy and slender abdomen adorned with a reddish black band and a white band in the center.

17. *Thyene imperialis* (Rossi, 1846)

Common name: Jumping Spider

Family: Salticidae

Genus: *Thyene*

Status: Rare

Identification keys: The cephalothorax is yellowish brown, male possess slender red abdomen with white median band, horizontal white stripe and two white dots.

18. *Icius alboterminus***Common name:** Jumping spider**Family:** Salticidae**Genus:** Icius**Status:** Rare**Identification keys:** Cephalic region is black, there is a white band surrounding the Cephalic region which is passed from beneath the eyes, Abdomen is brown having 4 white spots on it.**2. Family: Araneidae****1. *Argiope aemula* (Karsch, 1878)****Common name:** oval St Andrew's cross spider,**Family:** Araneidae**Genus:** *Argiope***Status:** Rare**Identification keys:** Cephalic region covered with white hairs, Abdomen is bright in colour having a good yellow - black parallel transverse strips, at the anterior end of the abdomen two yellow coloured broad bands present.**2. *Cyclosa confragra* (Thorell, 1892)****Common name:** trashline orbweaver**Family:** Araneidae**Genus:** *Cyclosa***Status:** Rare**Identification keys:** Abdomen is long pointed at posterior end with brown median line, legs are translucent, the spiral shaped web is it's characteristic**3. *Argiope anasuja* (Thorell, 1878)****Common name:** Signature Spider**Family:** Araneidae**Genus:** *Argiope***Status:** Rare**Identification keys:** The Abdomen is creamish white with black dots and strips, The Cephalothorax is wide than abdomen with yellow, black and white bands, arrange it's legs in the web forming a cross shape.**4. *Araneus mitificus* (Simon, 1886)****Common name:** Kidney Garden Spider**Family:** Araneidae**Genus:** *Araneus***Status:** Rare**Identification keys:** Cephalothorax is light yellowish to green in colour, Abdomen is round, white in colour and possess bean shaped black patch at anterior end, bears four black patches at posterior end and four spots at middle.**5. *Cyrtophora citricola* (Forskal, 1775)****Common name:** Tropical tent- web spider**Family:** Araneidae**Genus:** *Cyrtophora***Status:** Rare**Identification keys:** The body is greyish brown with tiny fine white hairs, the abdomen is much larger and semi rectangular in shape, it possesses rounded projection on the abdomen.**6. *Eriovixia excelsa* (Simon, 1889)****Common name:** HumpBack Araneid Spider**Family:** Araneidae**Genus:** *Eriovixia***Status:** Rare**Identification keys:** The abdomen is much swollen and larger than cephalothorax dark brown in colour having creamish brown patches and four spots on it, the body is covered with tiny white hairs, legs are brown and translucent, eyes are red.**7. *Neoscona crucifera* (Lucas, 1839)****Common name:** Hentz orbweaver, Spotted Orbweaver, and Barn Spider.**Family:** Araneidae**Genus:** *Neoscona***Status:** Rare**Identification keys:** The body possesses tiny hairs, the abdomen is swollen and much rounded in shape, females are reddish brown or dark red in colour while males are brownish black, they possess four distinct spots in the abdomen, the body is spotted with light dots.**8. *Neoscona bengalensis* (Tikader and Bal, 1981)****Common name:** Spotted Orb Weaver**Family:** Araneidae**Genus:** *Neoscona***Status:** Rare**Identification keys:** Cephalic region is covered with brownish white hairs while Abdomen possess white spines, reddish brown legs bearing white spines.**9. *Argiope sp.*****Common name:** Garden Orb-weaver**Family:** Araneidae**Genus:** *Argiope***Status:** Rare**Identification keys:** Cephalic and Abdomen region covered with brown hairs, first two pairs of legs are longer than other.**10. *Poltys sp.*****Common name:** Orb Weaver**Family:** Araneidae**Genus:** *Poltys***Status:** Rare**Identification keys:** Arranged its legs in a way that eyes are protruded between legs, brown in colour and first two pairs of legs are longer than other.**3. Family: Oxyopidae****1. *Oxyopes bharatea* (Gajbe, 1999)****Common name:** Lynx Spider**Family:** *Oxyopidae***Genus:** *Oxyopes***Status:** Rare**Identification keys:** The lateral sides of the cephalothorax are dark orange surrounding the white and orange bands in the middle, the abdomen possess broad and long orange band in the middle and lateral sides are white with black patches, Legs are light green and orange with dark spiny hairs.**2. *Oxyopes hindostanicus* (Pocock, 1901)****Common name:** Lynx Spider**Family:** *Oxyopidae***Genus:** *Oxyopes***Status:** Rare

Identification keys: The body is slender having brown legs with spiny black hairs, The cephalothorax possess dark brown, yellowish brown, orange bands respectively from outer to inner side, The lateral side of the abdomen is brownish black having creamish white lines, The middle portion of the abdomen forming 'V' shape with orange and white bands while the white bands meet together at the end of 'V' shape and constant as a single line to the posterior end of the abdomen.

3. *Oxyopes lineatipes* (C. L. Koch, 1847)

Common name: Common Garden Lynx Spider

Family: *Oxyopidae*

Genus: *Oxyopes*

Status: Rare

Identification keys: The cephalothorax and legs are lime green and translucent, the cephalothorax possess one median white band surrounded by reddish orange strips and then white bands, the abdomen is long, slender and cone shaped possessing orange band in the middle surrounded by white strips and then orange bands. Legs have black spiny hairs.

4. *Oxyopes shweta* (Tikader, 1970)

Common name: White Lynx Spider

Family: *Oxyopidae*

Genus: *Oxyopes*

Status: Common

Identification keys: The Cephalic region and Abdomen are white edged by brown colour, Abdomen is long pointed at posterior end, legs are brown bearing black spines.

4. Family: *Thomisidae*

1. *Indoxysticus minutus* (Tikader, 1960)

Common name: Indian crab spider

Family: *Thomisidae*

Genus: *Indoxysticus*

Status: Rare

Identification keys: The body is brown in colour, legs are brown, translucent having black spiny hairs and black bands, the abdomen possess black patches.

2. *Oxytate virens* (Thorell, 1891)

Common name: the grass crab spider

Family: *Thomisidae*

Genus: *Oxytate*

Status: Rare

Identification keys: The body is light green and translucent the abdomen is long and pointed at posterior end bearing brown spots on it, first two pairs of legs are much longer than the others.

3. *Thomisus onustus* (Walckenaer, 1805) [1]

Common name: The Pink Crab Spider

Family: *Thomisidae*

Genus: *Thomisus*

Status: Rare

Identification keys: The male is brown in colour having brown and black bands on legs, the female is white in colour having brown tinge on Abdomen, in both, the abdomen bears two humps at posterior end, first two pairs of legs are longer than the others.

5. Family: *Cheiracanthiidae*

1. *Cheiracanthium triviale* (Thorell, 1895)

Common name: Yellow Sac Spider

Family: *Cheiracanthiidae*

Genus: *Cheiracanthium*

Status: Rare

Identification keys: *Plexippus clemens*

6. Family: *Gnaphosidae*

1. *Gnaphosa poonaensis* (Tikader, 1973)

Common name: Ground spider

Family: *Gnaphosidae*

Genus: *Gnaphosa*

Status: Rare

Identification keys: The body is dark blackish brown in colour, Spinnerets are distinctly visible.

7. Family: *Theridiidae*

1. *Theridion manjithar* (Tikader, 1970)

Common name: tangle-web spider

Family: *Theridiidae*

Genus: *Theridion*

Status: Common

Identification keys: The Cephalic region and legs are brown and translucent, while the Abdomen is yellow forming a sac like structure.

8. Family: *Oecobiidae*

1. *Oecobius putus* (O. Pickard -Cambridge, 1876)

Common name: Wall Spider

Family: *Oecobiidae*

Genus: *Oecobius*

Status: Common

Identification keys: Cephalic region is black, while Abdomen is light in colour having two dark arrow shaped pattern on it.

9. Family: *Uloboridae*

1. *Uloborus plumipes* (Lucas, 1846)

Common name: the feather-legged lace weaver and the garden centre spider

Family: *Uloboridae*

Genus: *Uloborus*

Status: Common

Identification keys: Body covered with brown hairs, legs possess brown and white bands, Abdomen bears two humps, the first pair of legs are longer than other.

10. Family: *Pholcidae*

1. *Crossopriza lyoni* (Blackwall, 1867)

Common name: tailed cellar spiders, tailed daddy longlegs spiders, box spiders

Family: *Pholcidae*

Genus: *Crossopriza*

Status: Common

Identification keys: The Cephalothorax is grey in colour possessing depression in middle and darker vertical band, Abdomen is greyish bearing white and black patches, the legs are extremely long.

11. Family: *Lycosidae*

1. *Pardosa birmanica* (Simon, 1884)

Common name: Thin-legged Wolf Spider

Family: *Lycosidae*

Genus: *Pardosa*

Status: Common

Identification keys: Yelloish brown to black in colour Cephalic region covered with dark brown hairs, abdomen possess arrow shaped yellow structure and white dots, legs have yellow and drak brown strips bearing spines.

2. *Arctosa indica* (Tikader & Malhotra,1980)

Common name: wolf spider

Family: *Lycosidae*

Genus: *Arctosa*

Status: Common

Identification keys: The body is black with white spots on it, anterior end of the abdomen possess median white band and two white patches.

12. Family: *Tetragnathidae*

1. *Guizygiella melanocrania* (Thorell, 1887)

Common name: Asian long - jawed Orb-Weaver Spider

Family: *Tetragnathidae*

Genus: *Guizygiella*

Status: Rare

Identification keys: The cephalothorax and legs are red while the abdomen rounded and creamish white, red bands are present on the lateral side of the abdomen, three pairs of black spots present in the middle of abdomen, first two pairs of legs are longer than other, the body is full of fine tiny hairs.

13. Family: *Scytodidae*

1. *Scytodes* sp.

Common name:

Family: *Scytodidae*

Genus: *Scytodes*

Status: Rare

Identification keys: The cephalothorax is orange and translucent having two horizontal brown bands in the centre and 'U' shaped strip at the posterior end of it, the abdomen is yellow with black spotted vertical lines, legs are orange and semitransparent with black spot on its joints.

14. Family: *Clubionidae*

1. *Clubiona pashabharii* (Patel & Patel, 1973)

Common name: Sac spider

Family: *Clubionidae*

Genus: *Clubiona*

Status: Rare

Identification keys: brownish orange in colour, Cephalic region covered with white hairs, Abdomen possess pattern of dark brown spots on lateral sides which meets each other at the end, legs bear spines.

15. Family: *Sparassidae*

1. *Heteropoda venatoria*

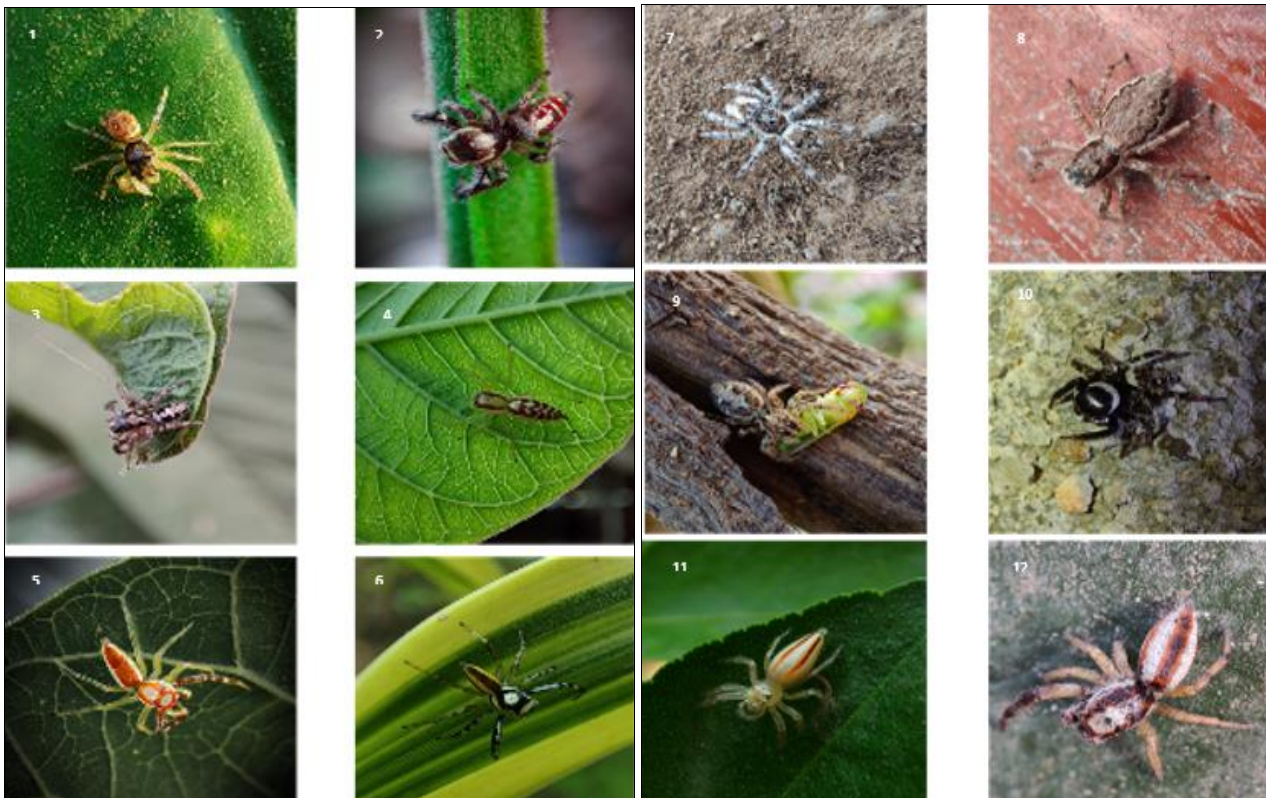
Common name: Giant crab spider

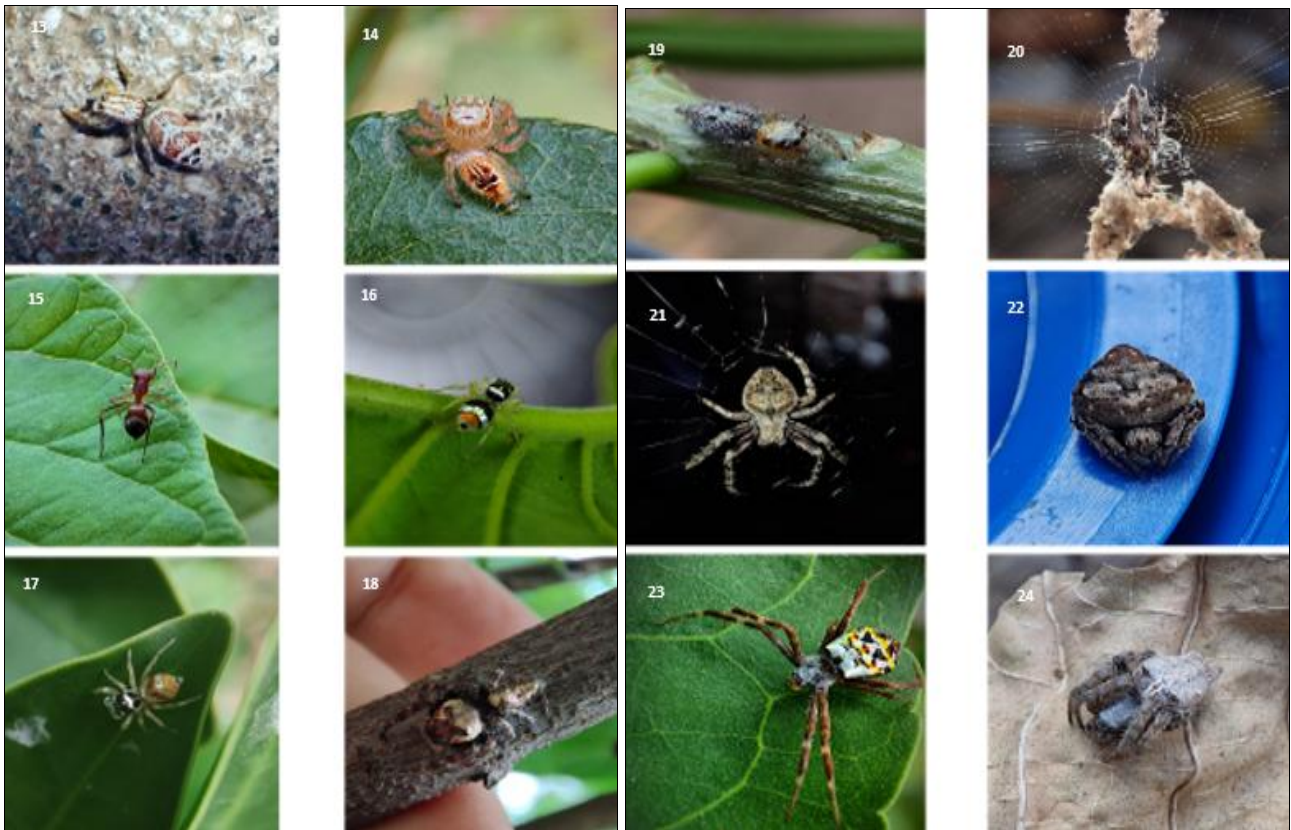
Family: *Sparassidae*

Genus: *Heteropoda*

Status: Common

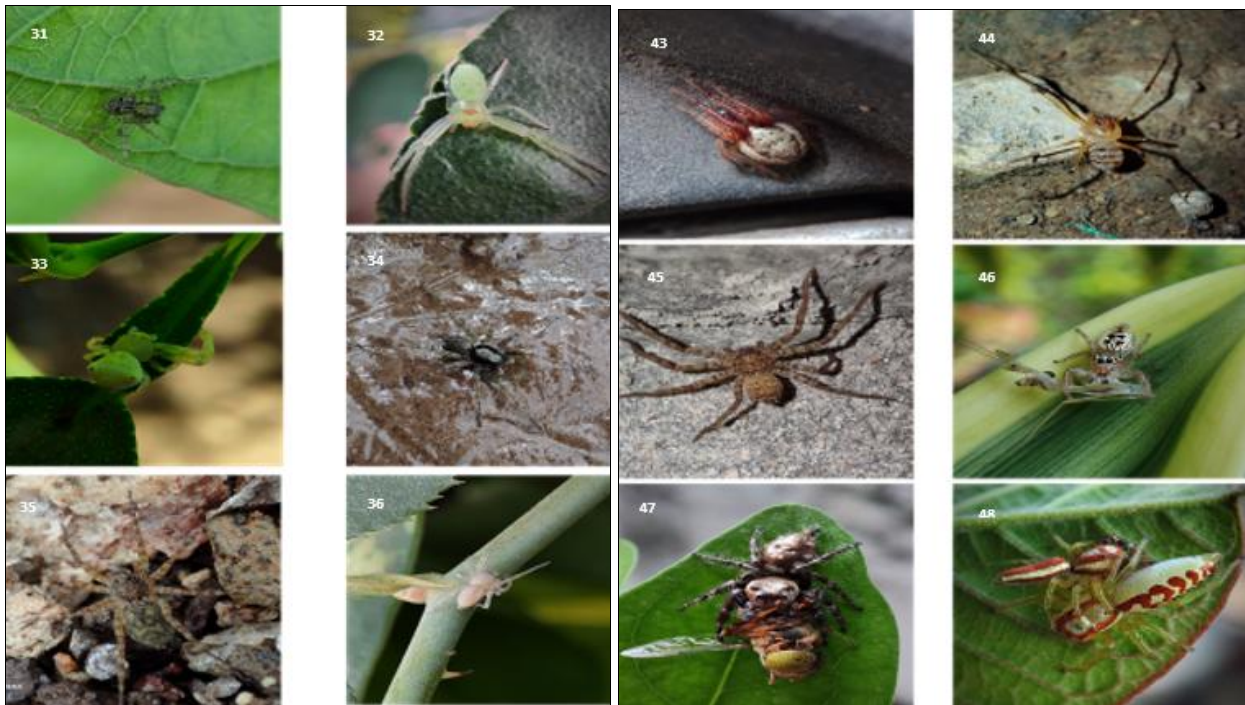
Identification keys: Brown in colour, the body is covered with hairs, legs having black spots at proximal end, the body is roughly flat





1. *Icius alboterminus* 2. *Thyene imperialis* 3. *Plexippus Clemens* 4. *Epocilla aura*(female) 5. *Epocilla aura*(male) 6. *Phintelloides versicolor* 7. *Menemerus nigli* 8. *Menemerus bivittatus* 9. *Plexippus paykulli* 10. *Hasarius adansoni* 11. *Telamonia dimidiata* 12. *Rudakius ludhianaensis* 13. *Rudakius ludhianaensis* (female) 14. *Thyene imperialis* (female) 15. *Myrmaplata plateleoides* 16. *Phintella vittate* 17. *Phintella vittate* (female) 18. *Hyllus semicupreus* (male) 19. *Hyllus semicupreus* (female) 20. *Cyclosa confraga* 21. *Neoscona crucifera* 22. *Eriovixia excelsa* 23. *Argiope anasuja* 24. *Cyrtophora citricola*





25. *Araneus mitificus* 26. *Neoscona bengalensis* 27. *Poltys* sp. 28. *Oxyopes hindostanicus* 29. *Oxyopes shwets* 30. *Oxyopes bharatea* 31. *Indoxysticus minutus* 32. *Oxytate virens* 33. *Thomisus onustus* 34. *Pardosa birmanica* 35. *Arctosa indica* 36. *Cheiracanthium triviale* 37. *Gnaphosa poonaensis* 38. *Theridion manjithar* 39. *Oecobius putus* 40. *Uloborus plumipes* 41. *Crossopriza lyoni* 42. *Clubiona pashabhaii* 43. *Guizygiella melanocrania* 44. *Scytodes* sp. 45. *Heteropoda venatiria* 46. *Thyene imperialis* female with prey 47. *Hyllus semicupreus* male with prey 48. *Epocilla aura* male with female

Conclusion

The Conclusion is taken out as the study area is rich in spider diversity which indicates the richness of the area. Total 39 genera of 15 families were recorded. Total 47 species were recognized. The family *Salticidae* has the highest number of species which is 39% of the total recorded species followed by family *Araneidae* with 20% abundance. *Salticidae* Family has the highest appearance throughout the study time period where as the Family *Araneidae* is the second highest followed by family *Oxyopidae*. This study shows the highest possibility of presence of the prey in the study area. The floral diversity and climate factors are favorable for them. Family *Tetragnathidae* is restricted to Monsoon Season, found around water bodies. Monsoon Season is mostly favorable to *Tetragnathidae* and *Scytodidae* families which indicates presence of adequate amount of prey. The High amount of Species belonged to family *Salticidae* indicate the presence of favorable Atmosphere, Climate and richness of food resources.

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