



Diversity of Spider Species and Families of Jungle Ecosystem of Barpeta District, Assam

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ABSTRACT

The objective of the study is to document the spiders in jungle ecosystem of Barpeta District, Assam. Visual search sampling method was adopted in this study to sample the spider fauna. Aerial hand, ground hand and beat sheet collection methods were followed. Specimens were collected, preserved in 70 % ethyl alcohol. After one year of collection, 1013 spider individual belonging to 60 species of spiders belonging to 39 genera and 14 families were documented. The most dominant family is Araneidae and Salticidae. The rarest family is Hersilidae, Philodromidae and Theraphosidae. The percentage distribution of spider species found in Barpeta district reveals that Argiope pulchella, the spider species is significantly available covering 12.83% of the total spider population in the entire district. The present study brings out only a portion of the diversity of the spider wealth that remains concealed in the landscape of Assam (Barpeta district).

KEYWORDS

Spider, jungle, Barpeta.

INTRODUCTION:

Spiders included in class Arachnida, order Araneae under Phylum Arthropoda, are an ancient and successful group of invertebrate animals. They constitute largest order of arachnids. They rank seventh in total species diversity. Spiders are cosmopolitan and are found in all types of habitats and occupy almost all niches (Turnbull, 1973). It would seem logical that the spider community would be a key component of integrated pest management strategies. Spider surveys may provide an effective means for measuring the impact of habitat degradation or land use change on biodiversity.

Because of the remoteness of Northeastern India, the place has helped preserve its biodiversity. But due to above mentioned threats much of its diversity is being lost without any record. As spider species of Assam are poorly documented, thus in an attempt to assemble a comprehensive spider fauna list, the proposed study was carried out to document the spiders of jungle ecosystem of Barpeta District, Assam and which will also fill the existing void of Arachnology literature for the state and apprise future investigators of the spider fauna of Assam.

STUDY AREA:

Barpeta district, one of the districts of lower Brahmaputra valley of Assam, India covers an area of 3245 square kilometers. The district lies between latitude 26°5' N to 26°49' N and longitude 90°39'E to 91°17'E and is bounded by Royal Province of Bhutan (Manas N.P) and Baksa District in North, Kamrup and Goalpara districts in south, Nalbari district in east and Bongaigaon and Chirang district in west. The elevation of district ranges from 18 to 200 m above mean sea level. The climate of Barpeta is sub tropical. The maximum and minimum temperatures recorded are 35°C and 7°C respectively. The area receives an average rainfall of 1715 mm. The humidity ranges from 60-85%. The tropical semi-evergreen and mixed deciduous forests covers the district.

SEASONALITY OF STUDY SITE:

The year was divided, as per Barthakur (1986) into four seasons – Monsoon (June to September), Post-monsoon (October to November), Winter (December to February) and Summer (March to May).

STUDY PERIOD:

The study was carried out during April 2015 to March 2016 in all the four seasons of the year. The sampling was made between 7 A.M. to 11 A.M. and 1 P.M. to 6 P.M. under suitable weather conditions for spider collection.

SURVEY METHODS:

For the convenience of survey of spiders in Barpeta district of Assam, 10 political blocks were selected. 3 sites from each block were selected. Therefore, total sites sampled were 30.

SAMPLING METHOD:

Visual search sampling method (Robinson *et al.*, 1974; Sebastian *et al.*, 2005) was adopted in this study to sample the spider fauna from quadrates selected at random of selected study sites in all the four seasons. A total of 9 hours were spent in each site for each season, totaling 36 hours of sampling time across the four seasons. Collection was done from four quadrates (1m x 1m) placed in the respective corners of 10m x 10m area and all the vegetations were thoroughly examined from bottom to top.

COLLECTION METHODS:

The collection methods (Coddington *et al.*, 1991) adopted to carry out the sampling are Aerial hand collection, Ground hand collection and Beat sheet method.

PRESERVATION TECHNIQUE:

The spiders collected from each site were preserved in 70% ethyl alcohol (Sebastian *et al.*, 2005). The specimens were photographed with Sony digital camera- DSC-S800 either in the field or as soon as they are brought to the laboratory and stored in dark dry place.

IDENTIFICATION:

Specimens were identified in ZSI, Kolkata and also using primary taxonomic literature- 'Handbook of spiders' by B.K Tikader, 1987 and 'Spiders of India' by P.A. Sebastian and K.V. Peter, 2009 and deposited in the laboratory of B.H.College, Howly, Barpeta. The immature spiders were identified only to the generic level. The study was made using Advanced Binocular Research Microscope (Unilab) Model No. RH-85A UXL (Serial no. 35692).

RESULT:

A total of 1013 individuals belonging to 60 species were recorded. 39 genera and 14 families were collected during the study. The families: Araneidae (10 species), Herasilidae (1 species), Linyphiidae (2 species), Lycosidae (5 species), Nephilidae (3 species), Oxyopidae (5 species), Philodromidae (1 species), Pholcidae (5 species), Pisauridae (3 species), Salticidae (10 species), Sparassidae (3 species), Tetragnathidae (5 species), Theraphosidae (1 species) and Theridiidae (6 species) were identified and deposited in the laboratory of B.H.College, Howly,

Barpeta. The most dominant family are Araneidae and Salticidae. The rarest family are Hersilidae, Philodromidae and Theraphosidae.

Table 1 : List of species and Percentage distribution of spider species found in jungle ecosystem of Barpeta district.

Sl no.	Family	Species	Author	% of species
I.				
1.		<i>Argiope pulchella</i>	Thorell, 1881	12.83
2.		<i>Cyclosa bifida</i>	Doleschall, 1859	0.2
3.		<i>Cyclosa confragosa</i>	Thorell 1892	0.5
4.		<i>Cyclosa hexatuberculata</i>	Tikader, 1982	0.79
5.		<i>Cyclosa spirifera</i>	Simon, 1889	0.6
6.		<i>Cyrtophora cicatrosa</i>	Stoliczka, 1869	0.4
7.		<i>Cyrtophora moluccensis</i>	Doleschall, 1857	0.9
8.		<i>Gasteracantha kuhli</i>	C L Koch 1837	0.6
9.		<i>Neoscona muckerjei</i>	Tikader, 1980	4.05
10.		<i>Parawaxia dehaani</i>	Doleschall, 1859	0.1
II.				
11.		<i>Hersilia savignyi</i>	Lucas, 1836	0.2
III.				
12.		<i>Lepthyphantes sp. 1</i>		0.9
13.		<i>Linyphia striata</i>	Sp. nov.	1.18
IV.				
14.		<i>Lycosa mackenziei</i>	Gravely , 1924	2.46
15.		<i>Lycosa tista</i>	Tikader, 1970	2.37
16.		<i>Pardosa birmanica</i>	Simon, 1884	4.05
17.		<i>Pardosa pseudoannulata</i>	Bosenberg and Strand, 1906	1.48
18.		<i>Pardosa sumatrana</i>	Thorell 1890	1.88
V.				
19.		<i>Herennia multipuncta</i>	Doleschall, 1859	0.4
20.		<i>Nephila kuhlii</i>	Doleschall, 1859	0.2
21.		<i>Nephila pilipes</i>	Fabricius, 1793	0.5
VI.				
22.		<i>Oxyopes birmanicus</i>	Thorell, 1887	3.5
23.		<i>Oxyopes javanas</i>	Thorell, 1887	3.94
24.		<i>Oxyopes lineatus</i>	Latreille, 1806	2.46
25.		<i>Oxyopes shweta</i>	Tikader, 1970	2.96
26.		<i>Oxyopes sunandae</i>	Tikader, 1970	2.17
VII.				
27.		<i>Tibellus elongatus</i>	Tikader, 1960	0.4
VIII.				
28.		<i>Artema atlanta</i>	Walckenaer, 1837	2.07
29.		<i>Crossopriza lyoni</i>	Blackwall, 1867	8.09
30.		<i>Pholcus phalangoides</i>	Fuesslin, 1775	2.07
31.		<i>Smeringopus pallidus</i>	Blackwall, 1858	0.2
32.		<i>Uthina atrigularis</i>	Simon, 1901	0.2
IX.				
33.		<i>Perenethis venusta</i>	Koch 1878	2.37
34.		<i>Polyboea vulpina</i>	Thorell 1895	0.2
35.		<i>Thalassius albocinctus</i>	Doleschall, 1859	1.18
X.				

36.		<i>Asemonea tenuipes</i>	O P Cambridge, 1869	0.1
37.		<i>Carrhotus viduus</i>	Koch 1846	0.8
38.		<i>Epeus tener</i>	Simon, 1877	0.3
39.		<i>Hasarius adansonii</i>	Audouin, 1826	2.37
40.		<i>Hyllus semicupreus</i>	Simon, 1885	0.8
41.		<i>Menemerus bivittatus</i>	Dufour, 1831	0.4
42.		<i>Phidippus yashodharae</i>	Tikader, 1977	0.3
43.		<i>Plexippus paykullii</i>	Audouin 1826	7.2
44.		<i>Plexippus petersi</i>	Karsch, 1878	5.5
45.		<i>Telamonia dimidiata</i>	Simon, 1899	2.46
XI.				
46.		<i>Heteropoda leprosa</i>	Simon 1884	1.0
47.		<i>Heteropoda nilgirina</i>	Pocock, 1901	1.18
48.		<i>Heteropoda venatoria</i>	Linnaeus, 1767	1.3
XII.				
49.		<i>Leucauge decorata</i>	Blackwall, 1864	3.6
50.		<i>Leucauge tessellata</i>	Thorell, 1887	1.6
51.		<i>Tetragnatha andamanensis</i>	Tikader, 1977	0.2
52.		<i>Tetragnatha javana</i>	Thorell, 1890	0.2
53.		<i>Tetragnatha mandibulata</i>	Walckenaer, 1842	0.2
XIII.				
54.		<i>Ischnocolus khasiensis</i>	Tikader, 1977	0.1
XIV.				
55.		<i>Achaearana sp. 1</i>		0.2
56.		<i>Argyroides andamanensis</i>	Tikader, 1977	0.2
57.		<i>Argyroides argentatus</i>	OP Cambridge 1880	0.1
58.		<i>Argyroides flavescens</i>	OP Cambridge 1880	0.1
59.		<i>Argyroides gazedes</i>	Tikader, 1970	0.1
60.		<i>Theridion manjithar</i>	Tikader, 1970	1.48

The percentage distribution of spider species found in Barpeta district reveals that *Argiope pulchella*, the spider species is significantly available covering 12.83% of the total spider population in the entire district (Table 1). On the other hand the spider species like *Ischnocolus khasiensis*, *Asemonea tenuipes* and *Parawaxia dehaani* are found to be almost rare in the district just covering 0.1% contribution to the spider families.

Table 2: Percentage distribution of spider family in Barpeta district

Sl. no	Family	% abundance of different families
1	Araneidae	20.92
2	Hersilidae	0.19
3	Linyphiidae	0.02
4	Lycosidae	12.24
5	Nephilidae	1.08
6	Oxyopidae	15.00
7	Philodromidae	0.39
8	Pholcidae	12.63
9	Pisauridae	3.75
10	Salticidae	21.42
11	Sparassidae	3.45
12	Tetragnathidae	5.82
13	Theraphosidae	0.098
14	Theridiidae	2.17
Total		100

The table 2 reveals us that Salticidae family is found significantly contributing 21.42% of the total spider family found in the jungle ecosystem of Barpeta district, whereas spider family

Theraphosidae being almost rare in the district.

Conclusion:

The study holds importance in being the pioneering one which brings out the distributional status of the spiders in our state. A total of 1013 individuals belonging to 60 species were recorded. 39 genera and 14 families were collected during the study. The families: Araneidae (10 species), Herisilidae (1 species), Linyphiidae (2 species), Lycosidae (5 species), Nephilidae (3 species), Oxyopidae (5 species), Philodromidae (1 species), Pholcidae (5 species), Pisauridae (3 species), Salticidae (10 species), Sparassidae (3 species), Tetragnathidae (5 species), Theraphosidae (1 species) and Theridiidae (6 species) were identified. The percentage distribution of spider species found in Barpeta district reveals that *Argiope pulchella*, the spider species is significantly available covering 12.83% of the total spider population in the entire district. On the other hand the spider species like *Ischnocolus Khasiensis*, *Asemonea tenuipes* and *Parawaxia dehaani* are found to be almost rare in the district just covering 0.1% contribution to the spider families. Diversity of families proves to be important because they bear close association with the diversity of habitats. The percentage distribution of spider family reveals that the spider family Theraphosidae being almost rare in the district and the Salticidae family is found abundantly in Barpeta district contributing 21.42% of the total spider family found in the district which is also most diverse family among the other families. The present study brings out only a portion of the diversity of the spider wealth that remains concealed in the landscape of Assam (Barpeta district). There is a need to realize the importance of our biological wealth and continue the research and document them. As an inhabitant of the Barpeta district, the study is done in the area of Barpeta district, but it is the representation of the state Assam and further research is needed to be planned in the other district of Assam.

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