



Seasonal and collection method variation on spider abundance in Jungle ecosystem of Barpeta district, Assam

KEYWORDS

Barpeta, spider, visual search, seasons.

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ABSTRACT

The study area, Barpeta district of the state Assam, lies between Latitudes 26°5' N to 26°49' N and Longitudes 90°39'E to 91°17'E covering an area of 3245 sq Km. A year survey was carried out during April 2015 to March 2016 in all the four seasons of the year of this area to assess the spider diversity. Many specimens were collected by visual search methods and the collection methods adopted to carry out the sampling are Aerial hand collection, Ground hand collection and Beat sheet method. The specimens were preserved in 70% ethyl alcohol. 60 spider species from the different blocks of Barpeta District were documented. The paper shows the difference in quantity and quality of spider fauna in relation to the seasons and collection method. The spider species were more active in summer and post monsoon season and more than half of spider species were collected by aerial hand method.

INTRODUCTION:

Northeastern region of India, one of the richest hotspots of the world, has remained poorly explored, and much of its diversity is being lost without any record. Spider species of Assam are poorly documented & no research has been done so far for the applied use of spider & its related product in this region. Spiders, of class Arachnida, order Araneae under Phylum Arthropoda, vary considerably in size, shape and behavior. Spiders are cosmopolitan and are found in all types of habitats and occupy almost all niches (Turnbull, 1973). They play a significant role in the regulation of insect and other invertebrate populations in most ecosystems (Wise, 1993). Spider surveys may provide an effective means for measuring the impact of habitat degradation or change in biodiversity. Kato *et al.* (1995) discussed that climatic changes through seasons would influence the abundance of spiders. It may be due to the different seasonal preferences of different spider species. So, the proposed study was carried out with the objective to compare the spider abundance in different seasons using different collection methods in jungle ecosystem of Barpeta District 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. The elevation of district ranges from 18 to 200 m above mean sea level. The climate of Barpeta is sub tropical. 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 following collection methods carried out according to Coddington *et al.* (1991); Toti *et al.* (2000) -

- 1) Aerial hand collection i.e. collecting spiders found above knee level for that a sweep net was used to capture spiders seen high in the vegetation.
- 2) Ground hand collection i.e. collecting spiders found below knee level in the vegetation or leaf litter.
- 3) The beat-sheet method of collection performed by stretching out a light-colored cloth under the tree branch or other low vegetation and grabbing the branch and shaking it vigorously. Spiders resting or nesting in this vegetation fall onto the cloth.

PRESERVATION TECHNIQUE:

The spiders collected from each site were preserved in 70% ethyl alcohol (Sebastian *et al.*, 2005).

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.

RESULT AND DISCUSSION:

A total of 1013 individuals belonging to 60 species were recorded. 39 genera and 14 families were collected during the study. The result compares the difference in quantity and quality of spider fauna in relation to the seasons and collection methods.

Table 1: Percentage distribution of spider species in relation to collecting seasons in periodicity of occurrence.

Sl. No.	Collecting Seasons	No. of families	% of family	No. of species	% of species
1	Monsoon	08	57.14	21	35
2	Post-Monsoon	13	92.85	46	76.67
3	Winter	07	50	16	26.67
4	Summer	14	100	60	100

The percentage distribution of spider species in relation to four

collecting seasons in periodicity of occurrence shows that percentage abundance of spider species in summer season is 100% which is highest, followed by post monsoon season being 76.67%. The abundance of spider species is very less i.e. 26.67% in winter season thus shows those spiders are inactive during winter season and very active in summer season and post monsoon (Table 1).

Table 2: Study of spider fauna in relation to collection methods.

Collection Methods	No. of sample units	No. of adults	Mean no. of adults per sample unit	% of total adults	No. of species	Mean No. of species per sample unit	% of total species
Aerial	30	439	14.63	43.33	31	1.03	51.67
Ground	30	442	14.73	43.63	27	0.9	45
Beating	30	132	4.4	13.03	21	0.7	35
Total	30	1013	33.76	100	60	2	100

The study of spider fauna in relation with three collection methods shows that about 51.67% of total species were collected by aerial method. The number of individual was collected more by aerial than by ground or beating method. It may be for their abundance in vegetations of jungle areas. (Table 2).

So, it was found that maximum families and species were abundant during the summer season and least during monsoon and winter. Thus, clarifies that they are more active during summer. Also, it was found that Aerial hand collecting method of spider is more significant than all other trapping techniques. By Aerial hand method, more than half of the sample spiders were collected in the study.

Ironically, the spider diversity in Assam is still not fully explored or understood. It is intended that diversity of the spiders of BARPETA district, Assam will fill the existing void of Arachnology literature for the state and apprise investigators of the spider fauna of Assam. The present work brings out only a portion of the diversity of the spider wealth that remains concealed in the landscape of Assam (BARPETA district). So, there is a need to realize the importance of our biological wealth and continue the research and document them.

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