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### **Research Article**

# A PRELIMINARY INVESTIGATION OF SPIDER FAUNA IN ASSOCIATED MANGROVES OF MUTHUPET AT ADIRAMPATTINAM COAST, TAMIL NADU, INDIA

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### ABSTRACT

A preliminary survey of the spider fauna of Mangroves at Adirampattinam coast, Tamil Nadu was carried out from April 2013 to July 2013. A total of 9 species of spiders belonging to 6 genera under 5 families viz., Lycosidae, Oxyopidae, Araneidae, Tetragnathidae and Eresidae were recorded. Amongst these families the *Lycosa* species is the most dominated throughout the study period. The species diversity and richness was highest in the month of June.

Key words: Spider, diversity index and Mangroves.

### **INTRODUCTION**

The spiders play important role in maintaining biological balance of nature. Spiders can play an important role in stabilizing or regulating insect populations in agriculture as well as in forest ecosystem. The major contributions to Indian arachnology were made by Pocock and Tikader who made other researchers to take interest in research on spiders. About 40,000 spider species are currently known throughout the world. 14447 species from 59 spider families has so far been reported in India (Zoological Survey of India, 2012).Biological control through spiders is one of the best strategies to reduce the use of chemical pesticides as well as the population of the insect pests (Ghafoor and Mohamood, 2011). Taxonomic studies of different spider species from wildlife sanctuaries, paddy fields and cotton fields were investigated by many researchers (Vungsilabutr,1988; Sahu et al., 1996; Patal, 2003; Mathirajan and Raghubathy, 2003: Vanitha et al., 2009; Bhatkar, 2011; Phalgum Chetia and Dilip Kumar Kalita, 2012 and Mohsin Bukhari et al., 2012). The present study was aim to carry out survey of spider fauna in the associated

mangroves of Muthupet mangroves at Adirampattinam coastal area of Thanjavur district, Tamil Nadu. In general taxonomic studies on spiders of mangroves in India are comparatively few and limited. No specific extensive studies on spider faunal diversity in this region were done and published. It is the first approach in this region, to study the spider fauna, thus providing base line information for future studies.

#### MATERIALS AND METHODS

#### **Study Area**

For this study purpose spiders were collected from the mangroves plants such as *Avicennia* and *Rhizophora* species of mangrove forests of Adirampattinam coastal area situated in Thanjavur district, Tamil Nadu (Lat.10° 20' N Long.79° 23'E) on the southeast coast of India (Figure 1).

# **Collection and Identification of spiders**

The diversity and density of spiders throughout period of mangrove forest was investigated by hand picking method every week from April 2013 to July 2013. The collected spider specimens were preserved in 70% alcohol and identified on the basis of morphological characteristics, including eye arrangement, cephalothorax, legs, abdominal pattern and external and internal epigyne and palp structure. Epigyne in case of females and palps in case of males were dissected out and were made transparent with10% KOH. Spiders were identified up to species level using existing identification keys (Pocock, 1900 and Tikader, 1982, 1987).

# **RESULTS AND DISCUSSION**

The results of systematic survey are presented in the Table 1 and Figure 2. The spiders belong to 5 families, 6 genera and 8 species of the order Aranea (Table 2). Out of the 8 species, 4 are of orb weavers, one communal web revealing the social life and one tunnel web, one stalker (Figure 3). In the present survey, the family Araneida was the dominant family constituting 5 species from two genera (Tikader, 1987). Among the 8 species, Lycosa sp., (21.9%) represented maximum number of species (Figure 4) followed by Gasteracantha kuhlii (18%), Tetragnatha sp. (10.47%),Argiope anasuja (12.76 %), Stegoedyphus sarasinorum (12.57 %), Argiope pulchella (4.38 %), Gasreragantha sp. (13.4 %), Oxyopes sp. (5.33 %) and Argiope aurantia (1.33%).

Temperature (°C) and humidity (%) were recorded monthly in the mangroves during the study period significantly affected the species richness of the study area (Table 3). The results indicate that temperature and humidity are factors, which exhibited positive and negative relationship with density of spiders in the study area. The spider density increased with increase in temperature (June), while with the decreased in humidity. There was a significant decrease in the density of spider species.

Ecological parameters viz., species richness (R) were 1.719,1.692, 1.559 and 1.624 Shannon diversity index (H) were 2.045, 1.958, 2.018 and 2.004. Evenness index (E) were 0.9306,0.8913,0.9185 and 0.9122, in the month of April, may, June and July respectively in the associated mangroves of Muthupet at Adirampattinam (Table 4.) Lycosidae were the most populated Araneid fauna gathered from the whole period of study. The Lycosa sp. was 21.9 % of the total spiders. The spider diversity was 20 % in April, 21.5 %, in May, 32.19 %, in June and 26.28% in July (Figure 5). The maximum number of spider were collected in the month of June, because the climate condition i.e., temperature, relative humidity and abundant food (Ghafoor and Mohamood, 2011).

S. No.	Species	April	May	June	July	Total	Percentage
1	Argiope anasuja	16	13	21	17	67	12.76
2	Argiope pulchella	6	4	8	5	23	04.38
3	Argiope aurantia	2	1	3	1	7	01.33
4	Gasteragantha kuhlii	18	21	33	23	95	18.09
5	Gasteragantha sp.,	15	14	19	21	69	13.14
6	Stegodyphus sarasinorum	12	17	24	13	66	12.57
7	Lycosa sp.,	21	26	38	30	115	21.9
8	Oxyopes rufisternum.,	5	3	11	9	28	5.33
9	Tetragnatha sp.,	10	14	12	19	55	10.47
	Total	105	113	169	138	525	
	Percentage	20	21.52	32.19	26.28		

Table 1	. Monthly variation	of spider species	diversity in mangrove	s of Adirampattinam coastal an	rea.
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S. No.	Family	No. of genera	No. of species	Guild
1	Araneidae	2	5	Orb web
2	Eresidae	1	1	Communal web
3	Tetragnathidae	1	1	Orb web
4	Oxyopidae	1	1	Stalkers
5	Lycosidae	1	1	Tunnel web

**Table 2.** Total number of families, genera and species of spiders with their guild collected from

 Mangroves at Adirampattinam coast.

**Table 3.** Environmental parameters Vs density of spiders.

S. No.	Periods	Temperature (0 <sup>0</sup> C)	Humidity (%)	Density of Spider
1	April	30	90	105
2	May	30	85	113
3	June	32	80	169
4	July	31	90	138

Table 4. Spider diversity indices for monthly collected sample from April to July 2013.

Indices	April	May	June	July
Diversity (H <sup>1</sup> Log)	2.045	1.958	2.018	2.004
Richness (D)	1.719	1.692	1.559	1.624
Evenness (J <sup>1</sup> )	0.9306	0.8913	0.9185	0.9122



Figure 1. Location of associated mangroves of Muthupet at Adirampattinam coast.



Figure 2. Spiders collected from April to July in associated mangroves of Muthupet at Adirampattinam coast.



Figure 3. Web pattern of Spiders in associated mangroves of Muthupet at Adirampattinam coast.



Figure 4. Comparative density (%) of spiders recorded during the study area.



Figure 5. Monthly variation (%) of spider species diversity during the study period.

#### **CONFLICT OF INTEREST**

The authors declare that there are no conflicts of interest associated with this article.

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