ISSN 0375-1511

Rec. zool. Surv. India : **112**(Part-2) : 65-69, 2012

ARTHROPOD FAUNAL DIVERSITY IN SOME SACRED TREES OF SERAMPORE, HOOGLY, WEST BENGAL

SARMISTHA ROY[1], KULADEEP ROY[2] AND BULGANIN MITRA[3]

Dept. of Zoology, University of Calcutta[1]

Dept. of Psychology, University of Mysore[2]

Zoological Survey of India, M-Block, New Alipore, Kolkata - 700 053[3]

INTRODUCTION

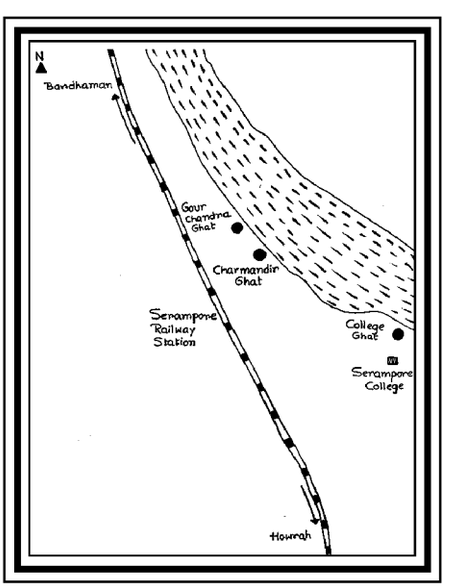
Kalpavriksha and Chaityavriksha scriptures mention that worshipping trees have been an ancient Indian practice. Considering trees as sacred entities, dates back to the era of the Aryans who worshiped nature. Plants and trees are associated with several Indian rituals and tree worshiping continues to be an aspect of modern Indian traditions. These trees are an important storehouse of biodiversity, having remained largely undisturbed by human interference and these are the last remnants of natural forests which should be preserved for conserve the local biodiversity.

Gadgil (1985) pioneered the view that sacred groves and sacred trees belong to a variety of cultural practices which helped Indian society to maintain an ecologically steady state with wild living resources. Kushalappa, C.G. and Bhagwat, S. A. (2001) reported about 14% of tree species, 26% of bird species and 44% of the fungal morpho types from the sacred groves. Besides this, there are plenty of published documents on the sacred groves related with socio-economy, cultural, floral compositions etc. But information on the insect and spider faunal diversity in general and their abundance in the sacred groves and sacred trees are very poor.

With this background the present study was undertaken in three sacred places situated near the College ghat, Gourchandra ghat and Charmandir ghat of Sreampore, Hoogly (Map-1). The plants of these sacred groves are *Ficus religiosa* (Aswatha), *Ficus bengalensis* (Bot), *Opuntia dillevii* (Fani Manosa), *Murraya paniculata* (Kamini), *Ocimum* sp. (Tulsi) and *Catharanthus roseaus* (Nayantara). This study is an attempt to build a database of arthropod faunal diversity of the sacred trees which highlights the ecological importance of these trees.

The collections have been made from the different parts of the plants, surrounding bushes and also from the soil of these sacred places. Altogether 59 species of insects under 8 orders and 5 species of the order Araneae reported from 3 selected sacred places.

The collections were mostly made by handpicking, aerial sweeping by Insect net. Pit fall traps were also used to collect the ground insects. The collections were mostly made in the morning



Map-1. Map of serampore and study area

Table-1: List of species and their distribution in three different ghats

ORDER	Sl. No	Species	Co.Ghat	Ch. Ghat	G. Ghat
COLEOPTERA	1	*Coelostoma* sp.	5		
	2	*Berosus indicus* Mots	5		
	3	*Berosus pulchellus* M'leay	3		
	4	*Helochares anchoralis* Sharp	1		
	5	*Guignotus flammulatus* Sharp	1		
	6	*Guignotus signatellus* Klog	1		
	7	*Coelophora unicolor*(Fabricius)	7		
	8	*Acupalpus* sp.	1		1
	9	*Odacantha* sp.			3
	10	*Cassida* sp.		3	4
	11	*Cicindela* sp.		1	
	12	*Micraspis cardoni*	3	1	
	13	*Henosepilachna septima*	2		
	14	*Pullus apiciflavus*	1		
	15	*Onthophagus* sp.	1		
ISOPTERA	16	*Odontotermes feae*(Wasmann)	7	11	10
DIPTERA	17	*Mesembrius bengalensis*(Wiedemann)	1		
	18	*Musca(Musca)domestica* Linnaeus	2	2	3
	19	*Parasarcophaga(p)albiceps* Meigen	1		1
	20	*Tinda javana*			1
	21	*Microchrysa flaviventris*	1		
	22	*Chrysomia aenea*	1		
	23	*Hermetia illucens*(Linnaeus)	1		
	24	*Stylia* sp.		1	
	25	*Dolichopus* sp.	1		
	26	*Culex* sp.	1		2
	27	*Physiphora aenea*	1		
	28	*Orthelia* sp.	1		
	29	*Callantra* sp.	2		1
	30	*Unidentified* sp.	1	1	
	31	*Unidentified* sp.	2	1	
HYMENOPTERA	32	*Apis indica* Fabricius	2		
	33	*Ropalidia* sp.			1
	34	*Vespa affinis* (Linnaeus)	1		
	35	*Polistes (Gyrostoma) olivaceous* (De Geer)	1		

ORDER	Sl. No	Species	Co.Ghat	Ch. Ghat	G. Ghat
	36	*Polistes(Gyrostoma) wattii Cameron*	1		
	37	*Camponotus compresus* (Fabricius)	5	5	2
	38	*Paratrechina longicornis* (Lateralis)		4	3
	39	*Tetraponera rufonigra* (Jerdon)	5	3	2
	40	*Polyrhachis (Myrmhopla) dives* Smith		4	
	41	*Pheidole* sp.	13	29	10
	42	*Pheidole spathifera* Forel		3	
	43	*Tetramorium walshi* (Forel)	9	10	12
HEMIPTERA	44	*Tropistethus indicus* Dall	3		
	45	*Rhodiginus dispar* Walker	1		
	46	*Serinetha angur* (Fabricius)		1	
	47	*Leptocentrus taurus* (Fabricius)	1		
	48	*Sadoletus validus* Distant	1		
	49	*Boccharis significatus* Distant	1		
LEPIDOPTERA	50	*Papilio polytes* Linnaeus	2		
	51	*Euploea core* Cramer	7		
	52	*Catopsila pomona*	1		
	53	*Precis lemonias* Linnaeus	1		
	54	*Precis* sp.	1		
DICTYOPTERA	55	*Blatella humbertiana* (Sauss)	4		3
	56	*Blatella germanica* (Sauss)			2
ORTHOPTERA	57	*Brachytrypes portentosus* (Lich)	1	1	
	58	*Aiolopus thalamus tamulus* (Fabricius)	1		1
	59	*Oxya hyla hyla*	1		2
ARANEAE	60	*Hersalia savignyi* Lucas	5	1	2
	61	*Salticus* sp.	6		1
	62	*Oyptila reenae* Basu	3		2
	63	*Clubiona* sp.	7	1	2
	64	*Oxyopes ratnae* Tikadar	2	1	
			137	82	72

Table-2 : Diversity and evenness indices of different groups and species and richness index of different species in three different localities

	COLLEGE GHAT		CHARMANDIR GHAT		GOURCHANDRA GHAT	
	GROUP	SPECIES	GROUP	SPECIES	GROUP	SPECIES
DIVERSITY INDEX	2.078	3.575	1.035	2.242	1.687	2.809
EVENNESS INDEX	0.422	0.727	0.235	0.509	0.394	0.657
SPECIES RICHNESS INDEX	-	10.163	-	4.312	-	4.910

and the late afternoon. Each sacred place was surveyed in three alternative months of the year 2009 (July, September and November). All the groups were identified separately and their numbers were determined. All the entomofaunal collections and plant species were identified from the Zoological Survey of India and Botanical Survey of India, Kolkata respectively.

STUDY AREA

The study was conducted in three sacred places of the Serampore (in between Lat. 22 ° 45 ' 8'' N and Long. 88 ° 21' 1''E), 25 kms away from Kolkata to the North in the district of Hoogly.

College Ghat : The name of this ghat is after the Serampore College which is very close to the river Hoogly. The grove has different plant species like *Ficus religiosa, Ficus bengalensis, Opuntia dillevii,* and *Cathranthus roseaus*. There is a small temple of Durga and Shiva in that ghat and people come everyday for worship.

Gourchandra Ghat : This ghat is closer to the river Hoogly than College ghat. This ghat was named after the name of Mahapravu Sri Chaitanya Deb (Gouranga). In that sacred groove, the important plant species is *Ficus religiosa* along with *Opuntia dillevii, Ocimum* sp. and *Muraya paniculata.* As such no temple is built here but the idols of the goddess of Durga and Shiva are worshiped here.

Charmandir Ghat : In the name of four Shiva temples this area is called Charmandir Ghat. The ghat is also very close to the river Hoogly. The trees like *Ficus religiosa, Muraya paniculata Plumeria obtusa* and *Opuntia dillevi* are found in this ghat. People come for worship to Lord Shiva.

RESULTS AND DISCUSSION

The observation from the present study indicates that a good number of species harbor in these sacred places which maintain the biodiversity of this particular area. During this survey 291 examples of 64 species belongs to 9 orders of phylum Arthropoda like, Diptera (15), Coleoptera (15), Hymenoptera (12), Hemiptera (6), Lepidoptera (5), Dictyoptera (2), Orthoptera (3) and Isoptera (1) and Araneae (5) have been collected from the different sacred groves. 6 different plant species were recorded collectively from the study sites of College ghat, Charmandir ghat and Gourchandra ghat to support those faunal groups (Table-1).

Among the 291 examples, College ghat shares maximum number of examples (137 examples) followed by Charmandir ghat (82 examples) and Gourchandra ghat (72 examples). Considering the species strength, out of 64 species of insects and spiders, College ghat shares maximum number of species (51), followed by Gourchandra ghat (22) and Charmandir ghat (20) (Table-1).

Species richness shows the maximum strength of any locality. In terms of both number of examples and number of species, College ghat stood in the highest rank and overall, the sacred grove of the College ghat is the most diversified and evenly distributed area by groups and species. Because of the availability, maximum number of fauna has been sampled from that ghat also. Comparing other two ghats, they have lower number of sampled fauna; however, Gourchandra ghat is more diversified and evenly distributed than the Charmandir ghat (Table-2).

It might be possible that the *Ficus* spp. were the most supportive habitat for overall faunal diversity. College ghat has more *Ficus* spp. than the other two localities. Probably the stable resource and environment of College ghat area could provide more number of arthropod groups and species. Gourchandra ghat and Charmandir ghat have almost same types of plant species. So, they have almost same types of species diversity and richness. The more detail study reveals the faunal inventory of the sacred groves and also describes the overall reasons of the selection of the habitats by various groups of insect and spiders.

ACKNOWLEDGEMENTS

The authors would like to thanks the Director, Zoological Survey of India, Kolkata for giving us opportunity to study the materials. We are also thankful to and Dr. G.Thirumalai, Scientist- F and in-charge of Entomology division and Dr. A. Bal, Scientist-F, Officer-in-Charge, Hemiptera Section for their kind support and help.

REFERENCES

Gadgil, M. 1985 Social restraints on resource utilisation: The Indian experience. In: Jeffrey A. McNeely and David Pitt (eds.), *Culture and Conservation-The Human Dimension: In Environmental Planning*. Croom Helm, London, pp. 135-154.

Kushalappa, C.G. and Bhagwat, S. A. 2001 Sacred groves: Biodiversity,threats and conservation. In U., Shanker, R., Ganeshaiah, K. N. and K. S.Bawa (eds) Forest Genetic Resources: Status, Threats, and Conservation Strategies. Oxford & IBH Publishing Co. Pvt. Ltd., pp. 21-29.

Manuscript Received : 18 August, 2011; Accepted : 19 March, 2012