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A PRELIMINARY STUDY OF THE DIVERSITY OF LIGHT ATTRACTED INSECTS AT LAKE TOWN AREA, NORTH 24 PARGANAS, WEST BENGAL

Entomology

Soumit Dutta* Vidyasagar College, Saltlake, Kolkata-700 091, India *Corresponding Author

Sinjini Bose Vidyasagar College, Saltlake, Kolkata-700 091, India

Dr. L. K. Ghosh Former Deputy Director, Zoological Survey of India, Kolkata, India

ABSTRACT

A light trap is a method to capture the light attracted insects. Species richness and seasonal occurrence can be done by this method which leads to calculate the different biodiversity indices. Insects were collected via light trapping from January, 2018 to March, 2018 from Lake Town, North 24 Parganas, West Bengal. The most prevalent order was Coleoptera followed by Hemiptera. Coleopteran insects showed most variations with 7 families. Dermapteran insects were of poor occurrence. With the gradual rise of temperature the increase of insects was observed. The fluctuation of number of insects captured via light trapping can be correlated with temperature, humidity and other environmental conditions.

KEYWORDS

Light trap, Light attracted insects, Lake Town.

INTRODUCTION

Insect diversity is quite rich, covering about 2/3rd of total animal species in India. Insects show a wide range of variation in their distribution, season wise and time wise. Some insects are abundant in daytime and some are at night. No insects maintain a constant population density throughout the year. A population study was done on some collected insects from the bio-ecozone of Lake Town, North 24 Parganas, West Bengal and on the basis of their availability their population density as well as percentage basis occurrence were shown.

Insects are collected by various methods such as netting, handpicking, sweeping etc. But the most simple and less hazardous method of insect collection is done by light trapping. In this method an artificial light like petromax gas-light was placed above a plate filled with soapy water. The insects get attracted to light and fall on the water surface and to be collected later on early. Earlier, Williams, 1940; Nath and Sen, 1979; Dutta et al., 1982; had worked on light attracted insects.

MATERIALS AND METHODS

A light trap was first installed by keeping a petromax lamp on a plate filled with soapy water. The whole setup was placed on a wooden stool and kept on a field within the study area. The light trap was put in early evening and it was kept overnight. Some of the insects attracted to light trap were captured by net and killed in killing jar with the help of benzene vapour. Some insects were collected from the soapy water from the flat dish placed underneath the light source. Collected insects were kept in glass vials containing 70% alcoholic solution. After sorting out, the collected insects were taken to laboratory where they were counted and the data were noted. Subsequently the collected insects were segregated to orders and families in which they belong, pinned, labelled and preserved for future study. Helps were taken from books to identify the insects. Identification of insects was done up to family level. The entire data were analyzed and represented in tabular form.

RESULTS AND DISCUSSION

Collection of insects via light trap method was made at a field in Lake Town. On the basis of collection following observations were made. The insects captured by light trap method were marked by temperature, humidity and other environmental conditions. It was observed that the density and the variety of different insect orders and families vary with the temperature, humidity and other environmental conditions. In relatively lower temperature less number of insects was found but in higher temperature their numbers increased (Fig.2). There was no rainfall during the study period from January, 2018 to March, 2018. A total of 607 insects were caught under light trapping method during the study period. The dominating orders of light attracted insects were Coleoptera (24.21%), Hemiptera (23.71%), Hymenoptera (15.65%) and Diptera (14.66%). Other orders captured in light trapping method were Orthoptera (9.39%), Lepidoptera (8.07%), Dictyoptera (3.79%) and Dermaptera (0.65%).

Table 1: Collection details and occurrence of light attracted insects order/family-wise in Lake Town.

Order	Family	Month			Total
		January	February	March	
		Temp.- 17C Humidity- 70%	Temp.- 24C Humidity- 61%	Temp.- 29C Humidity- 58%	
Diptera	Culicidae	11	19	12	89
	Muscidae	2	9	11	
	Cecidomyiidae	4	2	1	
	Tabanidae	3	6	8	
	Sepsidae	0	0	1	
Hemiptera	Pentatomidae	7	13	16	143
	Coreidae	7	12	19	
	Scutelleridae	1	4	4	
	Aphididae	3	11	8	
	Psyllidae	6	10	5	
	Reduviidae	5	6	6	
Coleoptera	Staphylinidae	1	2	3	147
	Tenebrionidae	5	7	9	
	Carabidae	10	6	10	
	Scarabaeidae	8	13	14	
	Meloidae	9	8	8	
	Chrysomelidae	4	5	7	
	Curculionidae	3	6	9	

Lepidoptera	Noctuidae	11	17	21	49
Orthoptera	Acrididae	8	1	9	57
	Tettigoniidae	1	2	0	
	Gryllidae	9	11	16	
Hymenoptera	Apidae	1	0	0	95
	Formicidae	28	17	19	
	Ichneumonidae	8	10	9	
	Bethylidae	2	1	0	
Dermaptera	Forficulidae	1	1	2	4
Dictyoptera	Blattidae	5	4	14	23
Total collected insects		163	203	241	607

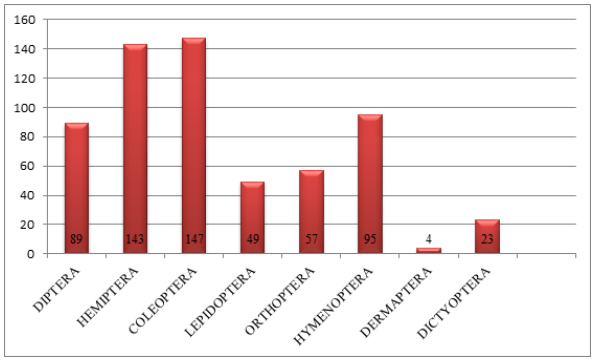

Fig. 1: Order-wise variation of light attracted insects at Lake Town.

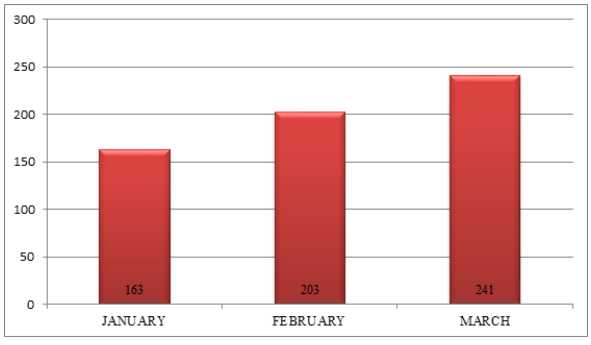

Fig. 2: Month-wise variation of light attracted insects at Lake Town.

Coleoptera shows highest degree of variation. Seven families are found in this order. These are Staphylinidae, Tenebrionidae, Carabidae, Scarabaeidae, Meloidae, Chrysomelidae and Curculionidae.The dominating family was Scarabaeidae (23.80%). Hemiptera also shows great variation with six different families- Pentatomidae, Coreidae, Scutelleridae, Aphididae, Psyllidae and Reduviidae of which Coreidae was most prevalent (26.57%). The orders Diptera, Hymenoptera and Orthoptera show mild variation with five, four and three families respectively whereas Lepidoptera, Dictyoptera and Dermaptera show least number of variations with one family each.

From the above study it may be concluded that Coleopteran fauna is the richest in the total insect biodiversity followed by Hemiptera as evaluation of insect diversity through light trapping is concerned (Fig.1). The number of insects captured by light trapping was noted maximum in the month of March and it gradually rises with the increase of temperature (Fig.2). Based on the above study, the diversity and the richness of insect fauna can be known in the study area. It also informs about the seasonal variation including late and early season of insect population within the study area. There is very good scope to work in this field of research and further studies are needed to get a clear picture of light attracted insects in India.

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REFERENCES

1. Dutta, B., Ghosh, L. K., Dhar, M. and Das, M. C. (1982). Study on Population Density of Light Attracted Insects from Calcutta Air-port. Proc. Symp. Ecol. Anim. Popul. Zool. Surv. India, Pt. 3, 79-81.
2. Nath, D. K. and Sen, S. C. (1979). Broods of the rice yellow borer, Scirpophaga incertulas (walk.) (Pyralidae, Lepidoptera) as determined by light trap catches and their significance in rice cultivation. Indian j. ecol., 2, 73-77.
3. Richards, O. W. and Davies, R. G. (2013). Imms' General Textbook of Entomology: Volume 2: Classification and Biology. Springer Science & Business Media.
4. Williams, C. B. (1940). An Analysis of Four Years Captures of Insects in a Light Trap. Part II. The Effect of Weather Conditions on Insect Activity; and the Estimation and Forecasting of Changes in the Insect Population. Ecol. Entomol., 90(8), 227-306.