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A taxonomic study on the aquatic insect of order coleopteran found in Jharkhand

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Abstract- 95 species of aquatic insects belonging to order Coleoptera have been recorded from a weed infested man made wetland water bodies in different parts of Jharkhand. Coleoptera was numerically the most abundant group comprising 39% of the total aquatic insect followed by Hemiptera (36%) and Odonata 25%. And the variation may be due to unfavourable water condition for the survival of the beetles due to pollution.

Keywords:- Aquatic insect, biodiversity, coleoptera, ecosystem

INTRODUCTION

Fresh water ecosystems are colonized by a diverse array of aquatic organisms. Aquatic insects, a group of arthropod, live their life cycle in water bodies and are found in or on the surface of the lentic or lotic water. There are 8 major orders of insects that spend at least a part of their life cycle in the fresh water ecosystem. Aquatic insect are considered as a very good indicator of water quality because of their wide range of environment disturbance tolerant levels. Some of these insects may be beneficial to human beings, while few others may be quite harmful. These insects form an important component of the food chain and energy flow pathway and comprises of a high proportion of biomass in fresh water ecosystem. Aquatic insects are used for assessing water quality and provide information to environmental managers to take accurate and justifiable actions in regards to the state and quality of

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water bodies. Many groups of aquatic insects are susceptible to pollution or alteration of their habitat. The presence or absence of aquatic insects can indicate whether a particular system is healthy or polluted pond often constitute biodiversity “hot spot” within the area. The information on aquatic beetles of India is known through the works of D’Orchymout (1928) and Vazirani (1969a, 1969b, 1977, 1984), where in the species from Central India were also included. Subsequently, Chandra *et al.* (2010) and Ghosh & Nilsson (2012) reported total seventy two aquatic beetle species from Madhya Pradesh.

MATERIAL AND METHODS

Study area

The field work was carried out on the different parts of selected areas in Jharkhand such as Ranchi, Khunti etc. the pond rivers and the rivers were selected for the purpose of study. In Ranchi Badatalab, Karamtoli tallab, Kanke dam etc was selected which is located in northern and eastern side of the Ranchi University.

Data were collected by four fields between November 2017 and February 2018. In each of the subdivisions, villages were randomly selected and surveyed through the help of participatory rural appraisal (PRA) tools like semi structured questionnaires, interviews, and field observations. In each of the villages sampled, at least 30% of the populations were surveyed. Respondents were basically men and women of age above 18 years. In total, 350 semi structured questionnaires were distributed. In case of grouped interview, open oral discussion on issues related to coleoptera consumption was engaged with the group. In either case, questions were asked on the consumption (larvae and adults).

Field work

Field work was conducted in rural areas of Jharkhand. This included regular outings spanning four seasons, with a stay of at least fifteen days per season in

several areas. The aim of the fieldwork was to conduct semi-structured interviews of the ethicist type (is a technique for a person to convert orally interviewer personal definition of the situation). The inhabitants of various localities were interviewed concerning the use of water beetles in their food. Interviews were carried out in the street markets, or on the streets or even in homes. The interviewees were adults of both sexes from 20 to 65 years of age.

Tools used

Tools generally used for the collection of the species were the planktonic net.

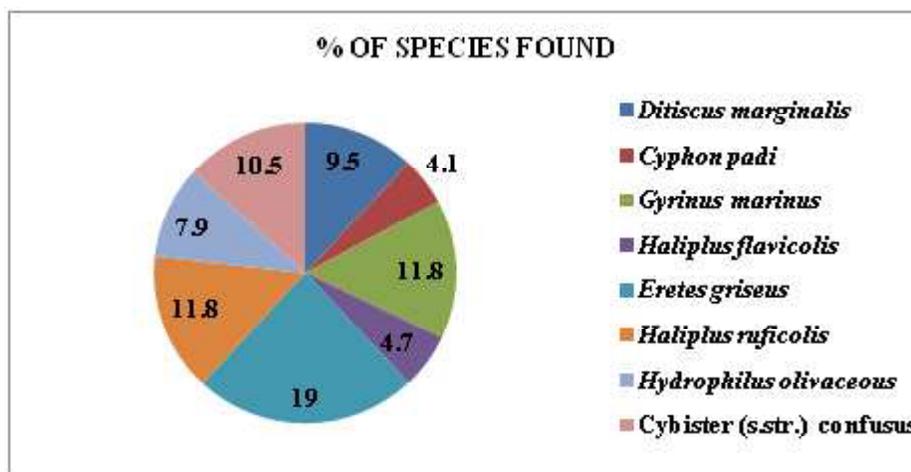
Sampling method

Random sampling of the local insect related to the study area was done during the period of 2017-2018 representation of each group and order was spread

Table 1- Shannon Weiner diversity index

SL. no.	Name of the insect group	Individual of species	Abundance $\pi = n/N$	Log π	$\pi \cdot \log \pi$ $H = \pi + \log \pi$
1	<i>Ditiscus marginalis</i>	10	0.10	-1	-0.1
2	<i>Cyphon padi</i>	23	0.24	-0.61	-0.14
3	<i>Gyrinus marinus</i>	8	0.08	-1.09	-0.08
4	<i>Haliphus flavicolis</i>	20	0.21	-0.67	-0.14
5	<i>Eretes griseus</i>	5	0.05	-1.3	-0.06
6	<i>Haliphus ruficolis</i>	8	0.08	-1.09	-0.08
7	<i>Hydrophilus olivaceous</i>	12	0.12	-0.9	-0.10
8	<i>Cybister (s.str.) confusus</i>	9	0.09	-1.04	-0.09

Graph 1- Percentage of species found during 2017-2018



preserved after proper pinning in the insect collecting box of the department laboratory. Appropriate photography of the sampling site as well as insect residing in that habitat was also done. Detailed taxonomic study was done in the laboratory with the help of Imm's taxonomic of each other. During the field sampling the numerical counting of the other individual of the same species in the particular quadrant was also done.

RESULTS AND DISCUSSION

From the 6 months of observation it revealed that the percentage of occurrence of *Haliphus flavicolis*, *Haliphus ruficolis* belonging from the family Halipidae with respect to other aquatic coleopteran families were the highest among the demonstrated areas of Ranchi district. Among the remaining species belonging to family Dytiscidae, Scirtidae, Gyrinidae and Hydrophilidae were found in all the water bodies but few in numbers.

CONCLUSION

Five families namely Dytiscidae, Scirtidae, Gyrinidae, Halipidae and Hydrophilidae are chiefly represented in the present report. The study opened the opportunities for future taxonomic and diversity studies on the aquatic Coleoptera of Jharkhand state.

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