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Aquatic Hemipteran biodiversity of Ranchi region of Jharkhand

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Abstract : The survey was under taken to investigate the aquatic Hemipteran biodiversity of Ranchi, Jharkhand, during September, 2019-February, 2020. The aquatic insects were collected by using net from the study area. The aquatic Hemipteran community was represented by seven families. The highest population of order aquatic Hemiptera was recorded during six month. Aquatic Hemiptera holds an important place in the ecology of freshwater and non freshwater ecosystem. They are important food for many organism including fish, amphibian and other animals. The chemical properties and the distinct taxa found in the water suggest that the water bodies are polluted and may be dangerous to the health of people around the reservoir.

Keywords : Aquatic Hemipteran biodiversity, organism, freshwater ecosystem, chemical properties

INTRODUCTION

Biodiversity refers to the variety and variability among living organism (number of different items/species and there relative frequency) in which they occur. During past twenty years on so biodiversity has attracted attention to numerous workers expediting fauna and flora of the world.[1] India is the one of the world's twelve mega diversity countries.[2] Insect contribute over half of all the recorded species and over three fourth of the estimated species in the globe.[3] Aquatic biodiversity is one of the most essential characteristics of an aquatic ecosystem for maintaining stability and a means of copying with any environmental change.[4] Aquatic insects are a group of arthropods that lives or spend part of their life cycle in water bodies.[5] They are the great important to water bodies where they are found and their presence in water serve various purpose, some serve as a food for fishes and other invertebrates, other acts as vector through which disease pathogens are transmitted to both human and animals.[6] Most importantly aquatic insects are very good indicators of water qualities since they have various environmental disturbances tolerant levels.[7] Aquatic Hemipteran stand out as an important group of aquatic insects, which are considered important in environment reclamation of aquatic habitats and are after used to gauge toxins in an environment.[8] The Hemipteran insect is a very successful aquatic group because of its adoptive nature in diverse ecological and geographical area and is especially economically important.[9] Majority of hemipteran are terrestrial but there are some species adapted to aquatic or semi aquatic life, occur in all type of fresh water habitat. They can be distinguish from other aquatic insect order by presence of piercing and sucking beak like structure of mouthparts and

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leathery anterior pair of wings at the base of membranous apically and completely second pair. They are highly predaceous some species are as veracious predators of fish, fry and fingerlings.[10] Not only they are most beautiful but they are most stable specimens that can be collected.[11]

MATERIALS & METHODS

Study Area

The field work is carried out on the two ponds and a river selected in Ranchi city, Jharkhand. The pond ecosystems taken under study are RIMS talab, Jora talab and Boreya River. RIMS talab is a rectangular in shape with cemented wall all around. Jora talab is also rectangular in shape, participation into two parts. Boreya River is situated in Boreya area with slow water flow.

Sampling Method

The present study is based on the studies carried out for a period of six month from September 2019 to February 2020. For sampling the two ponds area is arbitrarily divided in four zones North, South, East and West and for sampling of Boreya River in river edge is taken.

Collection are done using hand operated net and bar net from the above mentioned zones and river edge. After collecting the aquatic insects, it was identified by using taxonomic key and also by comparing the collected specimens through internet's photo of the specific insects was collected to know the abundances and fluctuations of each species.

RESULTS & DISCUSSION

The aquatic insects especially Hemipteran were collected in six month. Each aquatic net sample consists of ten separate sweeps done continuously. Abundance of different aquatic Hemipteran insect in pond and river of six month in table-1

Table 1- Abundances (total number) of Aquatic Hemipteran in ponds and river

Name of Insect (Family and Order)	No. of Aquatic Hemipteran in Pond / River		
Hemiptera	**Pond-1 (Rims Talab) total no. of insects in six month**	**Pond-2 (Jora Talab) total no. of insects in six month**	**River (Boreya River) total no. of insects in six month**
Water Strider (Gerrididae)	Present in Swarm	Present in Swarm	Present in Swarm
Broad Shoulder Water Strider (Viliidae)	Present in Swarm	Present in Swarm	Present in Swarm
Water Scorpion (Rantra Sp.)	38	73	125
Water Scorpion (Napidae)	138	175	150
Back Swimmers (Notonectidae)	36	62	57
Water Boatmen (Corixidae)	73	55	38
Giant Water Bugs (Belostomatidae)	15	17	20

Abundances (total no) of different aquatic Hemipteran in different ecosystem-

Aquatic Hemipteran insects

Water striders-

Water striders were found on the water surface of Rims talab, Jora talab and Boreya River were impossible to collect by swiping net. It was found all over season. They remain scattered throughout the water surface but some time they form swarm and they were about 500-1000 insect in a swarm. (Table-1)

Broad shoulder water striders-

Broad shoulder water striders were found in the Rims talab, Jora talab and Boreya River. There were 200-500 Broad shoulder water striders insect in each swarm.Table-1

Water scorpion-

Abundances of total number of Water scorpion *Ranatra* sp in Rims talab, Jora talab and Boreya River were 38, 73 and 125 respectively. Highest number of Water scorpion *Ranatra* sp were found in Boreya River followed by Jora talab and lowest number were in Rims talab. (Table-1)

Water scorpion-

These were found in Rims talab, Jora talab and Boreya River. Abundances of total number of water scorpion *Nepidea* in Rims talab, Jora talab and Boreya River were 138, 175 and 150 respectively. (Table-1)

Back swimmer-

Abundances of total number of Back swimmer in Rims talab, Jora talab and Boreya River were 36, 62 and 57 respectively. Highest numbers of Back swimmer were found in Jora talab followed by Boreya River and lowest numbers were in Rims talab. (Table-1)

Water boatmen-

Abundances of total number of water boatmen in RIMS talab, Jora talab and Boreya River were 73, 55, and 38 respectively. Highest number of water boatmen were found in RIMS talab followed by Jora talab and lowest number were in Boreya River. (Table-1)

Gaint water bug-

Abundances of total number of Giant water bugs in RIMS Talab, Jora Talab and Boreya River were 15, 17 and 20 respectively. Highest numbers of Giant water bug were found Boreya River followed by Jora talab and lowest numbers were in Rims talab. (Table-1)

In this research insect of 7 (seven) families of Aquatic Hemiptera order were collected such as water striders (Gerrididea), broad shoulder water striders (Veliidea),water scorpion (*Napidea* and *Ranatra* sp.), Back swimmers (Notonectidea),water boatmen (Corixidea) and Giant water bugs (Belostomatidea) from the ponds and river in different number. (Table-1)

Besides this, Anonymous (1980a)[12] took an experiment 'Aquatic hemiptera and Ephemeroptera in Dhaka city' and collected insect seven (7) families such as water boatmen (Corixidea) and Giant water bugs (Belostomatidea), water striders (Gerrididea), broad shoulder water striders (Vellidea), water scorpion (*Napidea* and *Ranatra* sp.), Back swimmers (Notonectidea) from the pond and the lake of Dhaka city. In the similar study of aquatic Hemiptera Goswami & Hazarika (2010)[13] recorded 14 species from two ponds of Gawhati University. Kalita (2008)[14] recorded 9 species from the deepor beel. Das & Gupta (2010)[15] recorded 12 and 10 species of aquatic Hemipteran respectively, they found highest density during post monsoon in agriculture field. Gupta & Narzary (2013)[16] reported 5 aquatic Hemiptera from Anua Lake of Cochar. Barman & Baruah (2014)[17] revealed 11 Hemipteran species from kapla beel of Barpeta district.

CONCLUSION

Study on biodiversity of aquatic insect is valuable research of the concerning area which gives on idea about the diversified environment of the ponds and the river. Aquatic insects are integral part of the aquatic ecosystem as they both ecological and economical value. The result obtained in the present study indicates that the aquatic Hemipteran collected from two ponds and river order Hemiptera represents the highest number of species. Aquatic hemipteran insect was found to vary in river and pond.

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