

# INVESTIGATION ON MACRO ZOO-BENTHIC FAUNA OF TWO PONDS OF MADHEPURA

Nivedita Bharti\*

Key words : Benthic community, Gastropoda, Oligochaetes

Two freshwater perennial ponds of Madhepura, (Bihar) were studied for the assessment of macro-benthic fauna. Total 24 species of macro zoo-benthos were collected from these two ponds. The gastropods were the most diversified group of zoo-benthic organisms.

## INTRODUCTION

India has a very rich aquatic resources. Although, in world status it ranks 1/25th in freshwater resources (40%). A great diversity in topography, diverse physiographic features and varied watershed pattern coupled with equally a high variability in rainfall provide a variety of freshwater habitats of great scientific interest besides constituting the inland fisheries resources of the country.

The zoo-benthic community occupies a pre-eminent position in the aquatic ecosystem, where the energy transformation takes place through the detritus food chain in a majority of instances. They help in the processing of organic matter and recycling of nutrients. Usually, macro-benthic fauna are micro-phageous, feeds either on the phytoplankton or bacteria or organic mud constituents which, in turn, eaten by many carnivore organisms including fish. The study of benthic communities in freshwater system helps in evaluating the prey based availability to support fish production on sustainable basis (Waters, 1988) and in assessing the water quality (Willhm and Dorrios, 1968; Hynes, 1970; Cairns & Dickson, 1971) Diversity and density of benthic fauna in a water body can indicate the type and level of organic pollution (Willhm, 1975; Mason, 1981). It has been reported that the composition of benthic fauna very considerably adjacent to the domestic sewage discharge site in comparison with the other areas of aquatic habitat, where, there is no effluent discharge (Singh, 1997). Some abiotic factors, like pH and hardness have been considered the most significant factors in determining the structure of zoo-benthic communities, especially of freshwater molluscs. Overall the benthic community of freshwater body is generally dominated by *Oligochaetes*, hirudineas, insects, gastropods and pelecypods.

## MATERIALS AND METHODS

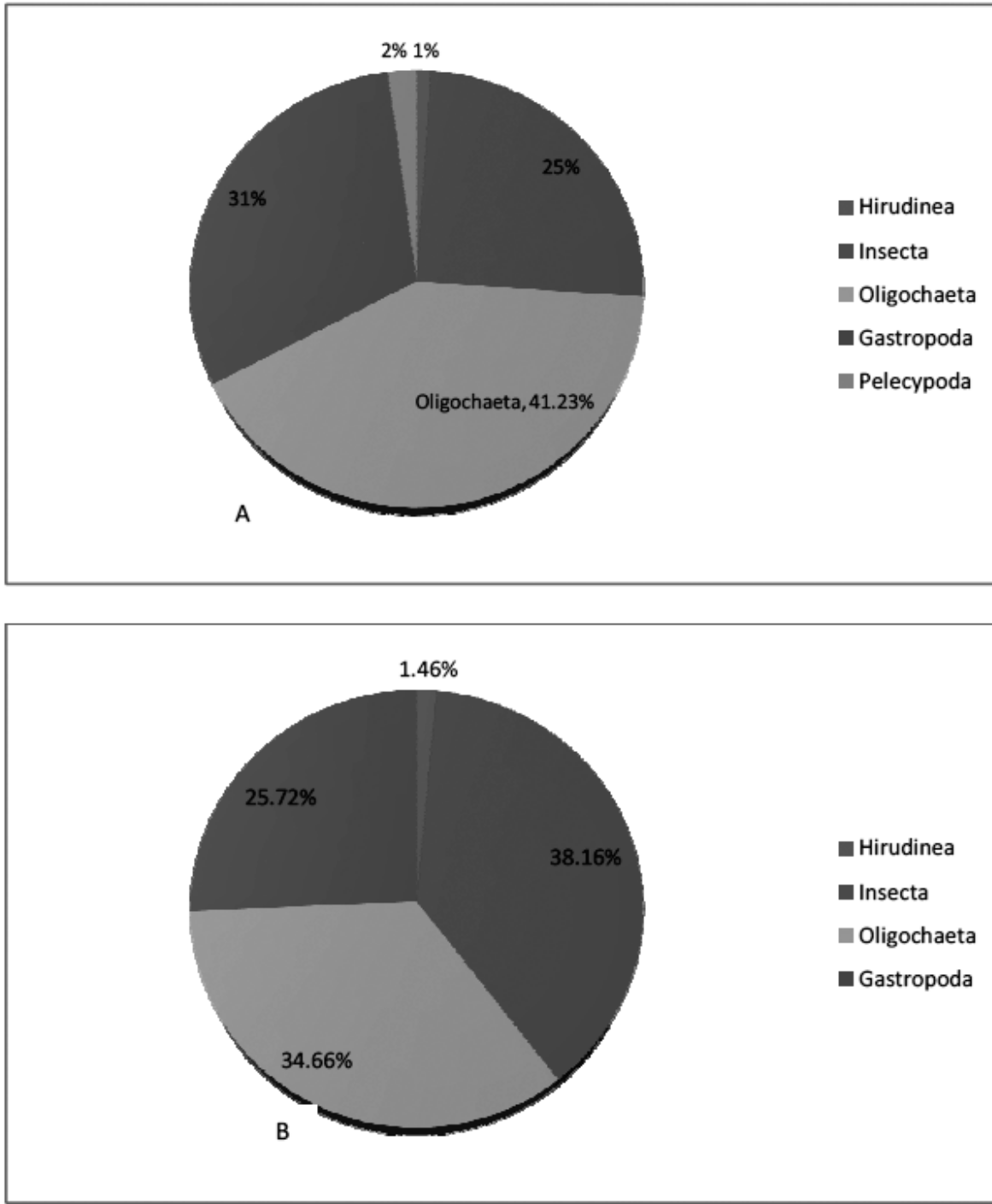
Two freshwater perennial ponds of Madhepura (Bihar) have been selected for the present investigations. Both the studied ponds are located at 26° 16' N latitude and 86° 28' longitudes.

For the analysis of zoo-benthic organisms, five (05) randomly selected samples were collected from both the ponds at the monthly basis continuously from July, 2008 to June 2010. The benthic fauna were sampled with the help of Ekman's dredge of 15.2 x 15.2 cm size. The benthic fauna were separated from the mud by sieving through a mesh screen (Brass Sieve No 40155) of 425/microns and the residual organisms were preserved in 5% formalin. The preserved samples were brought to the laboratory for further qualitative and quantitative analysis. In laboratory, materials were transferred to a white enamel tray, from where, the animals were sorted out manually and identified to the lowest possible taxonomic level with the help of available literatures (Stephenson, 1930; Needham and Needham 1978; Pennak, 1978; APHA, 1989). The identified specimens were confirmed with the courtesy of zoological survey of India, Kolkata and regional office of ZSI, Patna. The mean density values of five samples were converted to individual per meter square.

## RESULTS AND DISCUSSION

According to present investigation, a total of 24 species of zoo-benthic macro organisms were collected at both the ponds (Figure-1). They were mainly represented by Oligochaeta, Hirudinea, Insecta, Pelecypoda and Gastropoda. Total 21 species of benthic macro-invertebrates were collected at Pond-1 and 13 species at Pond-2 in which 10 species were commonly found in both the water bodies (Pond-1 & Pond-2). The present data show that the species composition of zoobenthic macroorganisms were more diversified at Pond-1 as compared to Pond-2. The distribution of total benthic fauna showed a definite seasonal change at both the water bodies, their maximum density was observed in winter followed by summer and minimum in monsoon months. Pond-1 was mainly represented by four (04) species of Oligochaetes, 01 hirudinea, 07 insects, 01 Peleypods and 08 gastropods; while, at Pond-2, it consists of 03 species of Oligochaetes, 01 hirudinea, 03 insects and 06 gastropods. Gastropods were the most diversified group of zoo-benthic organisms. *Diagoniostoma cerameopoma*, *Thiara tuberculata* and *Thiara granifera*

were the most abundant species at Pond-1, followed by *Bellamyia bengalensis* and *Bellamyia crassa*, at Pond-2, *Bellamyia bengalensis*, *Thiara tuberculata*, *Lymnea* sp. and *Diagoniostoma cerameopoma* were found in greater number. A heavy mortality of gastropods occur during the monsoon season have been observed. During the present investigation, some species of benthic fauna were found to be absent or decrease in number at the polluted pond i.e. Pond-2, It has been also reported that *Lamellidens consobrinus*, *Glossophonic*, sp and *Gyraulus* sp. are not found in the polluted area of pond (Singh and Sinha, 1993). These findings could be attributed to the intolerant nature of organisms to the organic pollution.



**Figure - 1.** Percentage composition of Macrozoo-benthic organisms [A] Pond-1 and [B] Pond-2 of Madhepura (Bihar)

REFERENCES

- APHA, (1989), Standard methods for the examination of water and wastewater.
- Cairns, J. and K.L. Dickson, (1971). A simple method for biological assessment on aquatic bottom dwelling organisms. *J. WPCF.*, 43 (5): 755-772.
- Hynes, H.B.N., (1970). *The Ecology of Running Water*. University of Toronto Press.
- J. Freshwater Biol.*, 5 (1) : 41-48
- Mason, C.F, (1981) *Biology of Freshwater Pollution*. Langwan Groups Ltd London, 250 PP.
- Needham, J.C. and P.R. Needham, (1978): *A guide of the study of freshwater Biology*. Holden-Day Inc, San Francisco, 108 pp.
- Pennak, R.W., (1978). *Fresh water Invertebrates of the United States*. Jhon wiely & Sons. Inc, New York, 626 pp.
- Singh, A.K., (1997). Abundance of Macro-zoobenthic organisms in relation to physico-chemical characteristics of river Ganga at Patna (Bihar). *Indian J. Environ. Biol.*, 18(2): 103-110.
- Singh, M. and R.K. Sinha, (1993). Factors affecting benthic macro invertebrate community in two ponds of Patna, Bihar, India
- Stephenson J., (1930). *The Oligochaeta*, Oxford University Press, London, 978 pp.
- Waters, T.F., (1988). Fish Production-benthos production relationships in Trout stream. *Polskie Archiwum Hydrobiologia*, 35: 548-561.
- Willhm, J.L. and T.C. Dorris, (1968). Biological parameters for water quality criteria. *Bioscience* 18: 477-481.
- Willhm, J.L., (1975). Biological indicators of Pollution. 375-402, In: B.A. Witton (ed.); *River Ecology*, Blackwell Scientific Pub., Osney Mead, Oxford.