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Seasonal Variation in Zooplankton Diversity of Banghara Holi Pokher, Ghataho, Samastipur (Bihar)

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Abstract: ***Zooplankton community is cosmopolitan in nature and they inhabit all freshwater habitats of the world. The zooplankton diversity is one of the most important ecological parameters in water quality and biodiversity assessment because they are strongly affected by environmental conditions and respond quickly to change in water quality. Zooplankton is the intermediate link between phytoplankton and fish. The present study deals with zooplankton analysis and its seasonal variation of Banghara Holi Pokher Ghataho, Dist. Samastipur, Bihar in order to estimate its potency for fish culture during period of Jan. 2017 to Dec. 2017. The zooplankton groups in order of dominance were rotifers, copepods, cladocerans, ostracods and protozoans were found to be dominant over other groups in all seasons and the population of Zooplanktonic groups were found to be generally high during summer and low during rainy season. Each group of zooplankton showed their own maximal and minimal peak.***

Keywords: Holi Pokher, Zooplankton diversity, Dominant group

I. INTRODUCTION

The zooplankton occupies a vital role in the tropic structure of an aquatic ecosystem and pla a key role in energy transfer. Unlike algae or phytoplankton, zooplankton are microscopic animals that do not produce their own food. Freshwater zooplankton play an important role in ponds, lakes, and reservoirs ecosystem and food chain. They not only serve a link between autotrophs and heterotrophs but link entire food chain and are main energy sources of fishes. Thus role of zooplanktons in the functioning of ecosystem is of paramount importance to human. The phenomenons are influenced by temperature, pressure, gravity and predators. Zooplanktons are always in variable proportion in an aquatic environment because the zooplankton feed on phytoplankton.

The present investigation was designed to study zooplankton analysis of Banghara Holi Pokher of village Ghataho, Dist. Samastipur, Bihar, because, no such work was done previously in this water body. Holi Pokher is large, deep, perennial rain cum river fed, roughly rectangular in shape. Perusal of work related to zooplankton analysis of different water bodies were done previously by Michael et. al. (1968); Edmonson, W.T. (1974); Nasar, S.A.K. (1977); Quasium, S.Z. (1977); Battish, S.K. (1992); Kaushik, K.S. et. al. (1994); Bhuiyan, A.S. et. al. (1998); APHA. (1998); Biswas, B.K. et. al. (2000); Dhanpati, M.V. (2000); Islam, M.N. et. al. (2000); Cottenie, K.N. et. al. (2000); Vaishali et. al. (2004); Pradhan, P. et. al. (2006); Islam, S.N. et. al. (2007); Kumar, Manoj (2009); and Pawar, S.K. et. al. (2009).Kumar, Ashok (2011), Uchchariya, D. K. et. al. (2012); and Singh, Karunesh et. al. (2012). It is apparent that much emphasis has been paid to study of zooplanktons at different water bodies at different places in India.A thorough knowledge of zooplanktons their abundance and distribution in this water body is essential for proper exploitation of fish culture.

II. METERIAL AND METHODS

Holi Pokher is situated in village Ghataho near village Kishunpur of Samastipur district. The intake of water occurs during rainy season. The water of this pokher is used for bathing of local villagers and drinking for cattle.

Zooplanktonic samples were collected on monthly basis from January 2017 to December 2017. The samples were preserved in 8% formalin and subsequently quantitative analysis was done by “Sedgwick-Rafter cell” expressed in number of organisms. Zooplankton species identified following Battish (1992).

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III. RESULT AND DISCUSSION

Zooplankton population of Holi Pokher Ghataho comprised generally rotifers, copepods, cladocerans, ostracods and protozoans. Quantitatively zooplanktons recorded were 2561 per liter of which rotifers were 832 (32.49%), copepods 632 (23.62%), cladocerans 376 (14.49%), ostracods 335 (13.08%), protozoans 349 (13.63%) and miscellaneous only 69 (2.69%).

All dominant groups of zooplanktons were present throughout the year. Zooplankton showed variations of their abundance during different months of the year maximum 12.72% in November and minimum 3.75% in July.

In all 17 species of zooplanktons were identified. Qualitative analysis showed that rotifers had 7 species, cladocerans, copepods and protozoans 3 species each and ostracodes 1 species.

All dominant groups of zooplankton were present throughout the year. Zooplanktons showed variations in their abundance during different months of the year i.e., zooplankton population showed distinct seasonal variations. Each group of zooplankton showed their own maximal and minimal peaks. Zooplankton fauna was abundant during winter (Oct. to Dec.) and again during summer (April, May)

Several workers have investigated on different water bodies from time to time to find out zooplankton. Ganpati, S.V. (1943), Michael, R.G. (1968), Edmonson, W.T. (1974), Quasium, S.Z. (1977), Battish, S.K. (1992), Bhuiyan, A.S. et. al.(1998), Biswas, B.K. et al. (2000), Vaishali et al. (2004), Pradhan, P. et al. (2006), Islam, S.N. et al. (2007) and Pawar, S.K. et al. (2009).

IV. SUMMARY

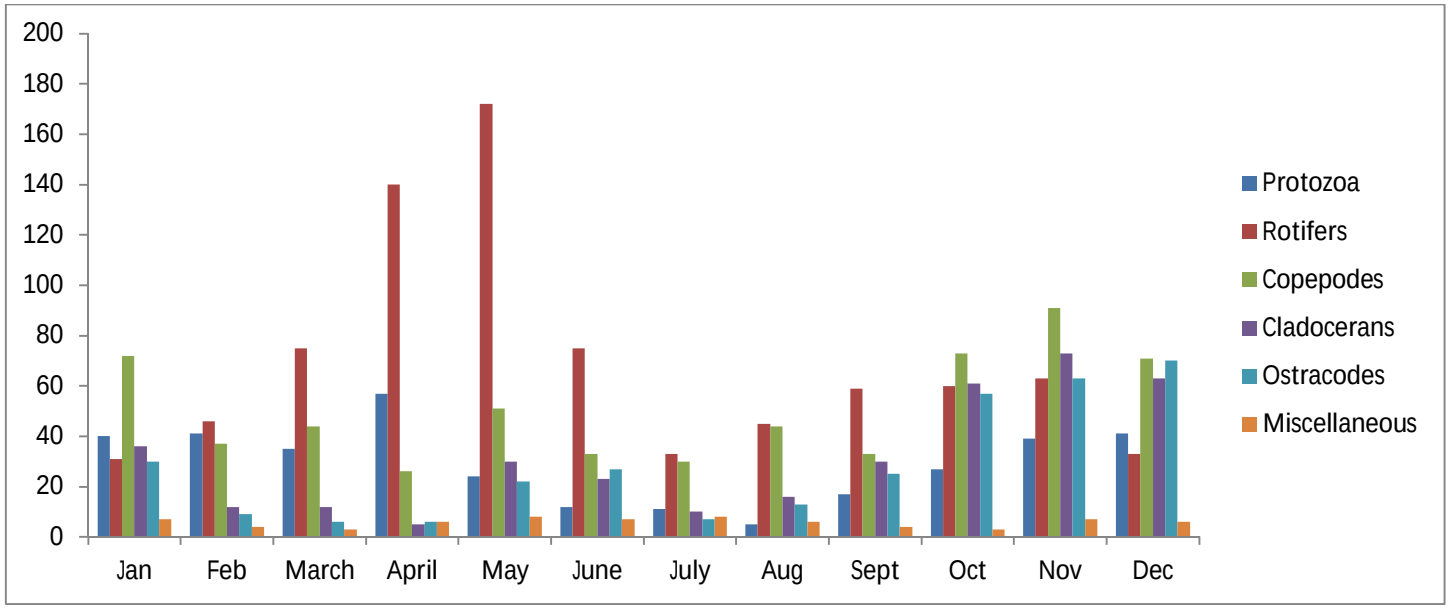
The zooplankton groups in order of dominance were rotifers, copepods, cladocerans, ostracods and protozoans were found to be dominant over other groups in all seasons and the population of Zooplanktonic groups were found to be generally high during summer and low during rainy season. Each group of zooplankton showed their own maximal and minimal peak.

TABLE-1

Net Zooplankton Production of Banghara Holi Pokhar, Ghataho, Samastipur (Bihar)

Major group of Zooplankton	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total	%
Protozoa	40	41	35	57	24	12	11	5	17	27	39	41	349	13.63
Rotifers	31	46	75	140	172	75	33	45	59	60	63	33	832	32.49
Copepodes	72	37	44	26	51	33	30	44	33	73	91	71	605	23.62
Cladocerans	36	12	12	5	30	23	10	16	30	61	73	63	371	14.49
Ostracodes	30	9	6	6	22	27	7	13	25	57	63	70	335	13.08
Miscellaneous	7	4	3	6	8	7	8	6	4	3	7	6	69	2.69
Total Zooplankton	216	149	175	240	307	177	99	129	168	281	336	284	2561	
Percentage	8.18	5.64	6.63	9.09	11.62	6.70	3.75	4.88	6.36	10.64	12.72	10.75		

Graph of Zooplanktons



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Table -2

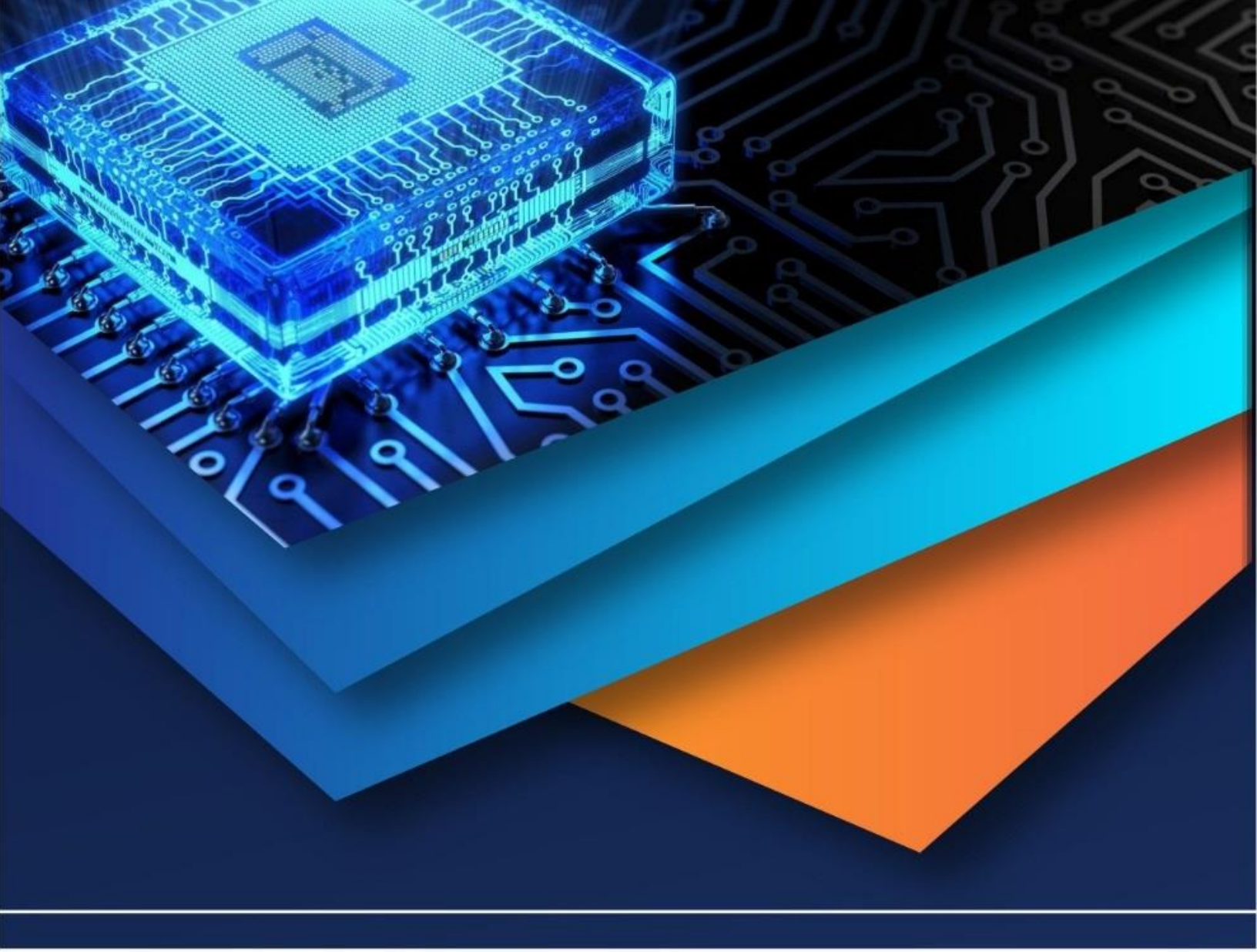
A list of zooplankton population of Banghara Holi pokhar	
A. Protozoans	*C. Copepods*
1. Paramecium sps	*11. Cyclops sps*
2. Euglena sps	*12. Nauplius sps*
3. Arcella sps	*13. Diatomus sps*
B. Rotifers	*D. Cladocerans*
4. Brachionus sps	*14. Daphnia sps*
5. Keratella sps	*15. Moina sps*
6. Polyarthra sps	*16. Ceriodaphnia sps*
7. Monostyla sps	*E. Ostracods*
8. Tricoceron sps	*17. Cypris sps*
9. Filinia sps	*F. Miscellaneous*
10. Testudinella sps	*18. Larvae of Insects*
	19. Larvae of Dragon fly

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