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Study of zooplankton in Sahasmal wetland of Koshi River, in Araria district (North Bihar), India

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Abstract : Zooplankton are the primary consumer of the aquatic food chain. It has been extensively studied in different water bodies of our country. Present study is related to zooplankton community of Sahasmal Wetland of Koshi River in Araria District, of North Bihar. The role of Zooplankton in the aquatic food chain is very important as it occupies the place of primary consumer and at the same time as secondary producer. The productivity of zooplankton will reflect the status of the aquatic system. In the present study of Sahasmal Wetland Araria, 11 species registered in Cladocera belong to 10 generations, 7 families, and 2 orders. Along with zooplankton, there were nematodes, aquatic insects and mosquito larvae. Among the phytoplankton, 12 species were registered with Bacillariophyceae, Chlorophyceae and Dinophyceae. Overall phytoplankton and rotifers contributed to the higher composition followed by copepods, cladocerans, and protists.

Key words: Zooplankton, Sahasmal wetland, Koshi River, Araria district

INTRODUCTION

We feel that the Earth is facing serious environmental problems along with rapid depletion of natural resources. Serious concerns have been expressed among scientists for the conservation and preservation of the world's natural resources. Lack of scientific data often leads to difficulties in decision making. Wetland is one of the important natural resources. Wetlands are areas of land that are either temporarily or permanently covered by water. This means that a wetland is neither truly aquatic nor terrestrial. It is possible that wetlands may be both at the same time depending on seasonal variability. Thus, wetlands exhibit enormous diversity according to their origin, geographical location, water system and chemistry, major plants and soil or sediment characteristics. Wetlands support a wide variety of plant and animal species that adapt to water fluctuations. The strata form wetlands of significant ecological importance. According to the utility, the wetland directly and indirectly supports millions of people in providing services such as food, fiber and raw materials, storm and flood control, clean water supply, natural beauty and educational and recreational benefits.

The Koshi River system and its tributaries are the important river basins of North Bihar. The Koshi River runs along the southern slope of the Nepal Himalaya

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(25°20' to 29°0'N and 85°20' to 89°0'E long). 70.409 covers the area of two countries spread over a catchment area of KN2. Nepal (59,570 KN2) and India (10,893 KN2 North Bihar). The river originates as 3 main from the glaciers of Mount Gaisithan (8013 m), Mount Everest (8848 m) and Kanchenjunga (8579 m) viz. Koshi broke its embankment at Kusha in Nepal on August, 2008 and flooded northern Bihar. Due to the flood, 13 km wide current spread to 100 km. More than one million people lost their crops, land and homes. The district that has suffered the tragedy of this flood also includes Araria in North Bihar.

Fish are mainly aquatic vertebrates. There is a system of adaptive interactions of fish with their environments in interrelation with biological and abiotic environments. If there is a change in the biological and abiotic environments, it usually has a profound effect on the fish and its habitat.

Zooplanktons are the primary consumer of the aquatic food chain. It has been extensively studied in different water bodies of our country by different researchers.[1-4] Present study is related to zooplankton community of Sahasmal Wetland of Koshi River in Araria District, of North Bihar. The role of Zooplankton in the aquatic food chain is very important as it occupies the place of primary consumer and at the same time as secondary producer. The productivity of zooplankton will reflect the status of the aquatic system.

MATERIALS AND METHODS

The Study was carried out in Sahasmal Wetland of Koshi River in Araria District, of North Bihar, Bihar, India. It is endowed with rich aquatic biodiversity of flora and fauna. Araria district is one of the thirty-eight districts of Bihar state, India. Araria district is a part of Purnia division.

Plankton samples were collected from Sahasmal Wetland of Araria district of Bihar by filtering 50 L of surface water through 63 LM mesh size nylon plankton net and preserved in 4 million formalin at the Zoology Laboratory of Purnea College. Surface water samples had to avoid macrophytes.

Collection of Zooplankton: It was collected through a continuous zooplankton and phytoplankton separator made out of nylon bolting silk.[5] Secondary production: It was estimated following method based on displacement volume.[6]

RESULTS AND DISCUSSION

A total of 40 species of zooplankton and phytoplankton were recorded during the study period. Sarcomastigophora with 4 species has 3 generations, 3 families, and 2 orders; Euselenzoa belongs to 2 genera with 2 species; 1 order and 1 family; Dinoflagellate of 1 species has 1 generation, 1 order and 1 family; Rotifer with 19 species belonging to 9 genera, 7 families, 2 orders; Cladocera belongs to 2 species, 2 families, with 11 genera, 9 genera, 7 families and 2 orders and copepoda; And 2 orders from 15 localities respectively Different wetlands of Jharkhand respectively (Table 1). Earlier, other authors also reported 19 species from the state of Bihar.[7] With respect to these several researches also played an important role in contribution to the study of phytoplankton, zooplankton and physico chemical parameters from ponds,

Table 1. List of reported species from the wetlands of Sahasmal, Araria

Si.no	List of examined species	Si.no	List of examined species
1	*Arcella discoides*	21	*Mytilina ventralis ventralis*
2	*Centropyxis ecornis*	22	*Lecane curvicornis*
3	*Centropyxis spinosa*	23	*L. leontina*
4	*Difflugia corona*	24	*Trichocerca diurella similis*
5	*Phacus acuminatus*	25	*Asplanchna brightwelli*
6	*Euglena acus*	26	*Polyarthra vulgaris*
7	*Ceratium hirundinella*	27	*Pseudosida bidentata*
8	*Brachionus angularis*	28	*Ceriodaphnia cornuta*
9	*B. calyciflorus f. dorcas*	29	*Daphnia carinata*
10	*B. caudatus personatus*	30	*Simocephalus vetulus*
11	*B. diversicornis*	31	*Simocephalus exspinosus*
12	*B. forficula forficula*	32	*Simocephalus vetulus*
13	*B. kostei*	33	*Bosmina longirostris*
14	*B. quadridentatus quadridentatus*	34	*Moina micrura*
15	*Keratella cochlearis*	35	*Macrothrix spinosa*
16	*K. lenzi*	36	*Chydorus sphaericus*
17	*K. tropica*	37	*Alona rectangula rectangula*
18	*Anaeureopsis fissa*	38	*Heliodiaptomus contortus*
19	*Euchlanis dilatata*	39	*Mesocyclops hyalinus*
20	*Euchlanis incisa*	40	*Mesocyclops leuckarti*

lakes and rivers of Bihar.[8-13] The origin of the rotifer species was detected in the Sahasmal wetlands of Araria district.

The species diversity of rotifers was maximum among zooplankton. Chandrasekhar and Chatterjee (2003)[10] reported 9 species of cladoceran from two lakes i.e. Dimna Lake and Jubilee Park lakes of Jharkhand. In the study of Sahasmal Wetland Araria, 11 species registered in Cladocera belong to 10 generations, 7 families, and 2 orders. Along with zooplankton, there were nematodes, aquatic insects and mosquito larvae. Among the phytoplankton, 12 species were registered with Bacillariophyceae, Chlorophyceae and Dinophyceae. Overall phytoplankton and rotifers contributed to the higher composition followed by copepods, cladocerans, and protists. Freshwater bodies have shrunk due to industrialization, human populations. Existing aquatic systems are polluted by many sources, causing water scarcity as well as non-susceptibility to the existence of aquatic organisms which is one of the main problems. Further research work will have to be explored in samples employed at regular intervals and seasonal interpretation and correlate physicochemical effects to estimate the ecological significance of wetlands.

REFERENCES

1. **Jana, B.B. 1979.** Temporal plankton succession and ecology of a tropical tank of West Bengal, India. *Int. Rev. Hydrobiol.* **64:**661-671.
2. **Sinha, A.B. and Sahai, R. 1978.** Studies on the factors affecting growth and productivity of free floating macrophytes in Ramgarh Lake of Gorakhpur (India). *In: Glimpses of Ecology* (ed. J.S. Singh and B. Gopal) *Int. Sci.* Publ., Jaipur.
3. **Patil, G.P., Kedar, G.T., Yeole, S.M. 2008.** Zooplankton biodiversity study of two water bodies in Washim district, Maharashtra. *J. Aqua. Biol*. **22(1):** 13-17
4. **Sharma, B., & Sharma, S. 1999.** Freshwater Rotifers (Rotifera: Eurotatoria). *State Fauna Series: Fauna of Meghalaya.* **4(9):**11-161.
5. **Nayar, Sasi, Gupta, T.R.C. and Gowda, G. 1991.** Secondary productivity and zooplankton biomass in a tropical coastal lagoon near Manglore. South West Coast of India. *Indian J. Fish.* **46(3):** 281-288.
6. **Manges, E. and Garcia, H. 1991.** Seasonal fluctuation of Zooplankton biomass in Lake Xolottan (Managua). *Hydrobiol. Bull.* **25(2):** 157-162.
7. **Michael, R. G., & Sharma, B. K. 1988.** Indian Cladocera (Crustacea. Branchiopoda. Cladocera). *Records of Zoological Survey of Indi*a. **108(2):**111-122.
8. **Biswas, S. 1966.** Five species of Daphnidae (Crustacea: Cladocera) from Simla Hills in India with a new record of Alona costata Sars, from Kameng Division, Nefa. *Journal of Zoological Society India,* **16:**92-98.
9. **Bohra, C., & Kumar, A. 2004.** *Plankton Diversity in the Wetlands of Jharkand*. Biodiversity and Environment APH Publishing Corp. New Delhi, 91-123.
10. **Chandrasekhar, S., & Chatterjee, T. 2003.** On the collection of Cladocera from Dimna and Jublee Park Lakes, Jamshedpur, Jharkhand. *Zoos Print Journal,* **18:**1089-1090.
11. **Edmondson, W., & Hutchinson, G. 1934.** Report on Rotatoria. Article IX. Yale North India Expedition. *Conneccuit Academic Arts and Science,* **10:**153-186.
12. **Mishra, A., & Hasan, S. 2013.** Assessment of water quality of Libri River, Purnia (Bihar). *International Research Journal of Science and Engineering*, **1(2):** 63-68.
13. **Sinha, K., & Sinha, D. 1983.** Seasonal trends in physico-chemical factors and zooplankton in a freshwater pond of Munger, Bihar. *Journal of Ecobiology*. **5(4):**299-302.

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