



Observation on the collection of zooplankton in Lakhani lake, district Bhandara, Maharashtra (India)

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Abstract

Zooplankton composition of Lakhani Lake, of Bhandara district (India) has been studied for a year. A total of 21 species were identified. 9 of them belonging to Rotifera, 8 to Cladocera, 3 to Copepoda and 01 to Ostracoda. The study of zooplankton diversity would be very useful in preparing the biodiversity atlas of the planktonic species as well as in future environment impact assessment studies.

Keywords: *Bioindicator, Cladocera, Eutrophication, Lakhani lake, Rotifera, Zooplankton*

Introduction

Bhandara district is popularly known as 'Lake District'. It possesses more than 15000 lakes and reservoirs. Studies on freshwater biodiversity of Bhandara district are scarce. Zooplanktons occupy an important position in the trophic structure and play a major role in the energy transfer of an aquatic ecosystem.

Anthropogenic activities at the basin of lake and nearby agricultural runoff increased the organic load, which considerably alter their physico-chemical characteristics and accelerate the process of eutrophication, which alter food chain sequences leading to production of commercially less valuable higher trophic organisms (Rao, 1982). One of the main difficulties in studying loss of biodiversity due to eutrophication is the absence of previous records of species composition. The present work was undertaken to study the zooplankton composition of Lakhani Lake, Lakhani of Bhandara District. Notable contributions on zooplankton of fresh water

ecosystem are available due to Sharma (1996), Kodarkar (1999) and Kudari *et al.* (2005).

Materials and Method

Lakhani Lake is about 100 year old, situated in the urban area, surrounded by nearby agricultural land. The water body is organically enriched with anthropogenic activities as well as agricultural surface runoff. Samples were taken monthly for a year by plankton net of bolting cloth of 25 μ . The samples were preserved in 4% formaline and observed and identified by using the literature of Ward and Whipple (1959), Micheal and Sharma (1988), Dhanapathi (2000) and Sehgal (1983).

Result and Discussion

Zooplankton recorded from Lakhani Lake, Lakhani belong to Rotifera, Cladocera, Copepoda and Ostracoda. The lake was dominated with Rotifera followed by Cladocera, Copepoda and Ostracoda. A total of 21 species were identified, 9 of them belonging to Rotifera, 8 to Cladocera, 3 to Copepoda and 1 to Ostracoda.

The Lakhani lake is largely colonized by submerged and emerging macrophytes, which

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almost completely occupy its surface area. Littoral rotifers, members of Cladocerns and ostracods favour this kind of environment (Rocha *et al.*, 1995). Out of 9 species of rotifers, 5 species belongs to Brachionidae and one species of Lecanidae and one from Asplanchnidae. Brachionus was the prominent genus represented by 07 species i.e. *Brachionus calyciflorus*, *B. Calyciflous amphiceros*, *B.falcatus*, *B. quadridentatus*, *B. bidentata*, *Plationus patulus* and *Keratella tropica*. Genus Brachionus is one of the most ancient genus of monogonont rotifers and is represented by 46 species in India (Sharma,

1983). The genus Brachionus is the index of eutrophic waters (Sladeczek, 1983) and its abundance is considered as a biological indicator for eutrophication (Nogueira, 2001). The species *B. calyciflorus* is considered to be a good indicator of eutrophication (Sampaio *et al.*, 2002). According to Liu Fengqui (1996), the small population of Copepods is directly proportional to the large population of the Rotifer species appeared in waters with high eutrophication. The dominance of Rotifer species indicates organic pollution due to direct entry of untreated sewage from catchments area (Arora, 1966).

Table:1. Diversity of Zooplankton from Lakhani Lake, Maharashtra (India)

| Rotifera | Cladocera | Copepoda | Ostracoda |
|--|--|---|---|
| Family: Brachionidae <i>Brachionus calyciflorus</i> <i>B.calyci. amphiceros</i> <i>B. falcatus</i> <i>B. quadridentatus</i> <i>B. bidentata</i> <i>Plationus patulus</i> <i>Keratella tropica</i> | Family: Sididae <i>Diphanosoma sarsi</i> <i>Diphanosoma excisum</i> | Family: Cyclopidae <i>Mesocyclop</i> spp. <i>Ectocyclops phaleratus</i> | Family:Cyclopidae <i>Cypris</i> spp. |
| Family: Lecanidae <i>Lecane</i> sps. | Family: Macrothricidae <i>Macrothrix</i> spp. <i>Ilyocryptus</i> spp. | Family: Diaptomidae <i>Heliodiaptomus viduus</i> | |
| Family: Asplanchnidae <i>Asplanchna brightwelli</i> | Family: Chydoridae <i>Chydorus</i> spp. | | |
| | Family: Daphnidae <i>Cereodaphnia cornuta</i> <i>Simocephalus</i> spp. | | |
| | Family: Moinidae <i>Moina micrura</i> | | |

About 600 species of fresh water Cladocerans have been reported (Korovchinsky, 1996) to occur throughout the world and in India 110 species have been recorded (Patil and Goudar, 1989). In the present study 08 Cladoceran species are recorded. According to Uttangi (2001) Cladocerans prefer to live in clear water. In the littoral zone, the Chydorus species usually associate with macrophytes, periphyton or sediment. The Cyclopoids Copepods were recorded during early winter may be due to the water with heavy algal blooms (Meshram, 1996). Ostracod gave very little contribution in the

zooplankton diversity and occurs occasionally. The present study indicates that the water body is highly eutrophic and a sustainable and holistic management planning is necessary for conservation of this lake.

References

- Arora 1966. Studies on India Rotifer –V. Arch. *Hydrobiol.*, 61:482-483.
- Dhanapathi M.V.S. 2000. *Rotifers from India* I.A. A. B. Publ. Hyderabad.
- Kodarkar M. S. 1999. *Conservation of lake in and around Hyderabad* I. A. A. B. Publ. Hyderabad.



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- Kudari V. A., G. G. Kadadevaru and R. D. Kanamadi 2005. Zooplankto Composition in some ponds of Haveri district, Karnataka. *Zoos' Print Journal*. 20(12): 2094-2099.
- Liu Fengqui, 1996 production and Application of Rotifers in Aquaculture, *Aquaculture Magazine*, 22(3): 16-22.
- Meshram C. B. 1996. *Limnological studies of Wadali lake*, Amravati., Ph.D. thesis.
- Michael and Sharma 1988. *Fauna of India, Indian Cladocera*.
- Nogueira M. G. 2001. Zooplankton composition dominance and abundance as indicators of environmental compartmentalization in Jurumirim Reservoir (Parapaneme River), Sao paula, Brazil. *Hydrobiologia* 455: 1-18.
- Patil, C. S. and B. Y. M. Gouder 1989. *Freshwater invertebrates of Dharwad*, Prasaranga, Karnatak university, Dharwad.
- Rao I. S. 1982. *Ecology of Manjira Reservoir, Sangareddy, Andhra Pradesh*, Ph.D. Thesis, Oosmania Unv. Hyderabad, 294.
- Rocha, O., S. Sendacz and T. Matsumura-Tundisi 1995. (Eds.) *Limnology in Brazil*. ABC/SBL, Rio de Janeiro, 376pp.
- Sampaio, E. V., O. Rocha, T. matsumura-Tundisi and J. G. Tundisi 2002. Composition and abundance of zooplankton in the limnetic zone of seven reservoirs of the Parapanema river, Brazil. *Brazil Journal Biology*. 62(3): 525-545.
- Sehgal, K. L. 1983. *Planktonic copepods of freshwater ecosystems*. Interprint, New Delhi. Pp 169.
- Sharma, B. K. 1996. *Biodiversity of freshwater Rotifera in india*, a static report, Proc. Zool, soc. Calcutta. 49;73-85.
- Sharma, B. K. 1983. The Indian species of the genus Brachionus (*Eurotatoria: monogononta*). *Hydrobiologia* 104: 31-39.
- Sladeczek, V. 1983. Rotifers as indicators of water quality. *Hydrobiologia* 100: 169-201.
- Uttangi, J. C. 2001. *Conservation and management strategy for the water fowls of minor irrigation tank habitats and their importance as stopover site in the Dharwad district*, pp. 179-221. In: B. B. Hosetti and M. Venkateshwaralu, (Eds.) Trends in wildlife and management. Daya Publishing house, New Delhi, India.
- Ward and Whipple 1959. *Fresh water Biology*, 2nd edition, United state America.

