Journal of Research & Development, Vol. 5 (2005)
ISSN 0972-5407

Ecological Study of Khushalsar Lake, Kashmir: II. Zooplankton

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Keywords: Zooplanktons Khushalsar Lake

The Khushalsar lake (situated at an altitude of 1583 m a.s.l. at 34° 06' - 34° 08' N and 74° 47'- 74° 49'E) has been under strong biotic pressure due to rapid urbanization all along its periphery and has turned into hyper(eu)trophic stage (Pandit and Yousuf, 2003). A detailed limnological investigation of the lake was undertaken in 1987 - 89 by Pandit (1992), which indicated its advanced trophic status. During April - September 2003 a fresh survey of the lake with respect to ecology and socio - economics was undertaken by the students of P. G. Department of Environmental Science, University of Kashmir, so as to assess its current ecological status. In the present communication data on the zooplankton community of the lake collected during this survey is described.

Pandit (1992) has reported 69 rotifers, 29 cladocerans and 11 copepods in Khushalsar Lake on the basis of a detailed study during 1987 - 1989. As the water body has been all through under continued stress from urbanization all along its periphery the main objective of the present study was to find out if any changes have occurred in the dominance pattern of the zooplankton community in the lake from that reported by Pandit (1992). The plankton samples were collected on monthly basis and studied with the help of keys provided in Edmondson (1959), Pennak (1978), Sharma & Michael (1988), Koste (1978) and APHA (1998).

The present study revealed that the zooplankton population in the lake was dominated by Rotifera. A similar situation was reported by Pandit (1992). This can be explained on the basis that the lake was already hyper(eu)trophic in late eighties (Pandit and Yousuf, 2002) and since then there has been no improvement in the quality of the lake water during these years. Instead the situation has worsened. This is depicted by the dominance pattern of different taxa. A comparison of the dominance pattern of different zooplankters reported by Pandit (1992) and the present investigation is given in Table 1. From the data it is quite clear that although most of the zooplankters recorded as dominant by Pandit are still present in the lake, the sequence of dominance has significantly changed (Fig. 1) Among rotifers, for example, the five most dominant species during late eighties were *Filinia longiseta* >> *Philodina roseola* > *Keratella valga* > *Anuraeopsis fissa* > *Brachionus calyciflorus*. During the present study the sequence of dominance was Bdelloid spp.>> *K. quadridentata* > *Brachionus quadridentata* > *B. bidentata* > *Polyarthra* sp. The dominance pattern in case of Cladocera shifted from *Chydorus sphaericus* > *Alonella exigua* > *Pleuroxus aduncus* > *Bosmina longirostris* > *Pleuroxus trigonellus* to *Ceriodaphnia quadrangula* > *Pleuroxus aduncus* > *Chydorus sphaericus* > *Daphnia pulex*, while that in case of copepoda larval stages > *Eucyclops speratus* > *Cyclops scutifer* > *Mesocyclops hyalinus* to larval stages > *Cyclops viridis* > *Eucyclops speratus* > *Mesocyclops* sp. It may be concluded that the

Table 1: Order of Dominance among different Zooplankton groups in Khushalsar Lake during 1987 - 89 and 2003

	RANK OF DOMINANCE	
	1987 - 89	2003
ROTIFERA		
1.	*Filinia longiseta*	*Bdelloid* spp.
2.	*Philodina roseola*	*Keratella quadridentata*
3.	*Keratella valga*	*Brachionus quadridentata*
4.	*Anuraeopsis fissa*	*Brachionus bidentata*
5.	*Brachionus calyciflorus*	*Polyarthra* sp.
6.	*Brachionus plicatilis*	*Platyias quadricornis*
7.	*Polyarthra dolichoptera*	*Brachionus* sp.
8.	*Brachionus quadridentata*	*Platyias patulus*
9.	*Polyarthra vulgaris*	*Trichocerca longiseta*
10.	*Bdelloid* spp.	*Keratella cochlearis*
CLADOCERA		
1.	*Chydorus sphaericus*	*Ceriodaphnia quadrangula*
2.	*Alonella exigua*	*Pleuroxus aduncus*
3.	*Pleuroxus aduncus*	*Pleuroxus similis*
4.	*Bosmina longirostris*	*Chydorus sphaericus*
5.	*Pleuroxus trigonellus*	*Daphnia pulex*
6.	*Simocephalus exspinosus*	*Bosmina longirostris*
7.	*Alonella excisa*	*Graptoleberis testudinaria*
8.	*Scapholeberis kingi*	*Daphnia* sp.
COPEPODA		
1.	Larval stages	Larval stages
2.	*Eucyclops speratus*	*Cyclops virdis*
3.	*Cyclops scutifer*	*Eucyclops speratus*
4.	*Mesocyclops hyalinus*	*Mesocyclops* sp

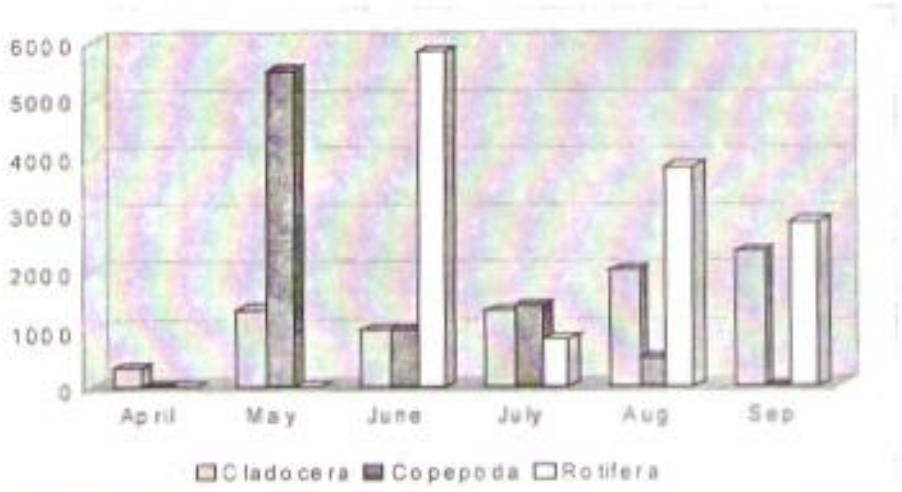

Fig.1. Mean population density of different zooplankton groups in Khushalsar Lake

zooplankton community of the lake is represented by typical eutrophic and hyper(eu)trophic taxa and the changes recorded in the dominance pattern of various taxa are attributable to the ecological set up of the water body, which has been continuously receiving domestic sewage from the catchment and its area is also decreasing day by day due to human encroachment.

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