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ZOOPLANKTON OF A HIGHLY SALINE WATER BODY, NEAR HYDERABAD, SINDH

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Abstract

Qualitative studies of zooplankton of a highly saline temporary water body near Rajputana Hospital, Hyderabad, Sindh, were carried out. Zooplankton occurred in March 1999, April and October 2000 when the salinity was 19.8, 25.0 and 2.5 ppt, respectively, but did not appear in July 1999 at a salinity of 30.0 ppt. Taxanomic identifications revealed that a cyclopoid copepod *Apocyclops* sp. and a rotifer *Brachionus plicatilis* were abundant zooplankter of the community in March. In October however, higher population of another cyclopoid copepod *Mesocyclops leuckarti* was recorded. The other zooplankton, among copepods were one harpacticoid, *Onychocamptus mohammed* and a calanoid copepod species, while the only cladoceran, *Moina brachiata* was very scarsely present. Among rotifers *B. quadridentatus*, *B. rubens*, *Lecane luna*, *Monostyla lunaris, Euchlanis* sp., *Mytilina* sp., and *Polyarthra trigla* also contributed to the community.

Key words: Zooplankton, hyper saline water , Hyderabad

Introduction

The importance of zooplankton in aquatic ecosystems is well known. There is lot of work done by many researchers. In Pakistan however, some researchers who worked on limnology and zooplankton are Baqai *et al.* (1974), Akhter and Ali (1976), Iqbal and Kazmi (1990), Mahar *et al.* (2000) and Baloch (2000). No previous information on zooplankton of saline waters in Pakistan is so far available.

Study area near Rajputana hospital is a larger but shallow strech of water, occupying an area about 2-3 km^2. The depth varies from few inches to 0.5 m, while salinity reaches to the highest peak in dry season (May-June) when the peripheral water dries up and crystals of salt can be seen.

Present study aims to provide information about the zooplankton community structure of this hyper saline water body.

Materials and Methods

Zooplankton and water samples were collected twice in a year; in March and July, 1999 and in April and October, 2000 from the same spot near overhead bridge, Rajputana hospital. All the samples were collected using a plankton net of 55 µm mesh size by horizontal towing. Plankton were preserved in 5% formalin. In sub-samples plankton were studied under a microscope using a Sedgewick-Rafter counting chamber. The identification of zooplankton was carried out during 2001-2002, using the keys and illustrations given by Mizuno (1964), Mizuno and Takahashi (1991) and Battish (1992).

Water temperature was recorded from the surface water using a mercury thermometer. Water samples were also taken for the determination of DO, pH and salinity.

Results and Discussion

Water temperature was 25°C in March that gradually increased to 32°C in July 99. In April 2000, water temperature was 26.5 that rose to 35°C in October. The pH of water was higher than 8.0 during July 1999 and April and October, 2000 indicating slight alkalinity except in March 99. Salinity was 19.8 ppt in March and 30 ppt in July 99, while in April, 2000 it was 25.0 ppt and reduced to 2.5 ppt in October. Dissolved oxygen was 9.0 and 10.7 mg l^{-1} in March and July 99, respectively. It was 5.0 and 8.5 mg l^{-1} in April and October 2000 (Table: 1).

A total of 14 zooplankton species occurred at Rajputana spot. The community was dominated by rotifers, constituting 8 species, among those *Brachyonus plicatilis* was the most dominant species (Table 2). It is widely accepted that *Brachyonus* genera is considered to be the indicator of eutrophic water bodies (Hakkari, 1978; Gannon and Stemberger, 1978; Maemets, 1983). The only cladoceran *Moina brachyata* appeared with very scarce population. Among copepods there were 5 species including three species of cyclopoids and one species each of calanoid and harpacticoid. *Apocyclops* sp. was the most dominant copepod. Zooplankton occurred in March 1999, when salinity was 19.8 ppt. Rotifer, *Brachyonus plicatilis* was most dominant and contributed about 60% of the community (visual enumeration). Occurrence of highest population of *Brachyonus plicatilis* was found in March 1999. It indicated that this species develops its population at higher salinity, as the salinity was recorded 19.8 ppt. This species is considered an estuarine species (Mallin *et al.*, 1995). *Apocyclop* sp. was secondly dominant and it contributed about 40% of the community in March 1999. Both of these species are considered as saline water species. As the salinity rose to 30 ppt during July 1999, zooplankton disappeared completely. In April 2000 the salinity was decreased to 25 ppt but zooplankton population remained very low. In October 2000 the salinity decreased to 2.5 ppt due to monsoon rains in the area. Zooplankton community estabilished high species diversity and *Lecane luna* and *Monostyla lunaris* replaced *Brachyonus plicatilis*. Among rotifers there also occurred *Brachyonus rubens*, *B. quadridentatus*, *Euchlanis* sp. *Polyarthra trigla* and *Mytilina* sp. It was first time noted that very scarce population of a cladoceran, *Moina brachiata* appeared when salinity was lower. Among copepods *Mesocyclops leuckarti* and *Tropocyclops* sp. also contributed to the community.

During present study it was observed that salinity is the main factor responsible for changes in zooplankton community. The copepod *Apocyclops* sp. is also a brackish water species. All the rotifer species found in this hyper saline water are littoral zooplankton usually occurring in saline and eutrophic water bodies.

Table 1: Physico-chemical parameters of shallow pond near Rajputana hospital.

Factors	March 99	July 99	April 2000	October 2000
Temperature (°C)	25.0	32.0	26.5	35.0
Salinity (ppt)	19.8	30.0	25.0	2.5
pH	7.4	8.0	8.5	9.8
D.O (mg l^{-1})	9.0	10.7	5.0	8.5

Table 2: List of zooplankton occurring in shallow pond near Rajputana hospital

Taxa	March 99	July 99	April 2000	October 2000
Copepoda				
Apocyclops sp.	+++	-	+	+
Mesocyclops leuckarti	-	-	-	++
Onychocamptus mohammed	+	-	+	–
Tropocyclops prassinus	-	-	-	+
Calanoid copepodid	+	-	-	-
Cladocera				
Moina brachiata	-	-	-	+
Rotifera				
Brachyonus quadridentatus	-	-	-	+
B. Rubens	-	-	+	+
B. plicatilis	+++	-	+	+
Euchlanis sp.	-	-	-	+
Lecane luna	-	-	-	+
Monostyla lunaris	-	-	-	+
Mytilina bicarniata	+	-	-	+
Polyarthra trigla	-	-	+	+

+++ = Abundant ++ = Common + = Rare – = Abunt

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