



STUDIES ON SEASONAL ABUNDANCE AND FLUCTUATION OF MACRO-ZOOBENTHOS IN JUNONA LAKE DISTRICT, CHANDRAPUR (M. S.)

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Abstract:

The diversity and seasonal variation in macro-zoobenthic fauna of Junona lake, Chandrapur district have been studied on the basis of collection obtained from seasonal surveys for a period of one year i.e. from Feb, 2007 to Jan, 2008. Benthic variables are particularly useful in measuring the water quality. In present piece of work, an attempt has been made to investigate the seasonal fluctuation of macro-zoobenthos in Junona lake. Total 17 species from four major groups were observed viz Annelida, Nematoda, Arthropoda and Mollusca. The macro-zoobenthos population was higher during monsoon season followed by winter and summer.

Keywords: Seasonal fluctuation, Macro-zoobenthos, Junona lake.

Introduction

The Junona Lake is artificial water body. It is renovated in the year 1906. The two minor tanks were merged and the lake updated and operated for the purpose of irrigation in year 1976. Reservoirs are artificial water bodies whose dynamics and structures present a pattern of organization mid way between those of rivers and lakes. The ecological processes in these ecosystems are much more complex and variable than those found in natural lakes (Agostinho and Gomes, 1997).

The composition and abundance of benthic animals are commonly used as bio-indicators to determine the impact of pollution on physio-chemical integrity of waters and changing the pattern of biotic characteristics of lentic and lotic system.

Biotic indices based on macro invertebrate community structure are widely used and alternatively biological monitoring offers a relative affordable means for environmental measurement compared to chemical data for assessing degradation of aquatic habitats and loss of biological diversity induced by anthropogenic disturbances (Karr, 1991, Hynes, 1994)

Several investigators such as Berg (1938), Mason *et al* (1971), Adarsh Kumar *et al* (2006), Malik *et al* (2010), Neeraj Kumar Sharma *et al* (2011)

The study was carried out in Junona Lake, which is 7 Km away from Chandrapur city. The present work was carried out for one year i.e. February 2007 to January 2008. The macro zoobenthos were collected seasonally over a period of one year at four sampling stations.

Material and Methods

During the period of investigation benthic samples were collected with the help of tray type sampler. Samples transferred into the laboratory in polythene bag and water benthic organism float on the surface and pick up with the help of dropper and preserved in 4% formalin and identified as per Edmondson (1959), Tonapi (1980), and Pennak (1989).

Result and Discussion

Many aquatic invertebrates have specific and narrow habitat requirement and are therefore restricted to places that are very little from year to year. Others are general and can survive over a wide range of habitat types (Thorp & Covich, 1991). In present investigation, total 17 species from four major groups were observed viz, Annelida, Nematoda, Arthropoda and Mollusca, in Annelides 2 species were recorded, Nematode by 2 species, Arthropodes by 4 species and mollusca by 9 species. Similarly, Anitha *et al.*, (2004) reported the macro-zoobenthic fauna from Mir Alam Lake, Hyderabad belonged to three major groups Annelida, represented by three species belonging to Tubificidae, Naididae and Lumbricidae, 4 species of Arthropoda belonging to Chironomidae and Notonectidae and 10 species of Mollusca belonging to Viviparidae, Thiridae, Planorbidae, Bithyniidae and Lymnaeidae

In Annelida, *Pristina aquiseta* recorded nearly from all the site as compare to *Tubifex tubifex* however *Tubifex tubifex* shows its appearances in all the seasons at site S2 and S4 and *Pristina aquiseta* showed its appearances at site S1. In general benthic communities of polluted water bodies are dominated by larval

forms of species belonging to tubificidae and chironomidae (Hynes, 1960), generally oligochaetes increase with eutrophication of water body (Brinkhurst, 1966,1974).

Nematode are infrequently observed from all the sites only Two species of nematode viz *Diplogaster ficator* and *Rhabdolimus minor* were recorded. Low organic matter on silt clay fraction may inhibit colonizations of macrobenthic fauna. Michel (1964) observed that the difference in total number of benthic organisms related to the nutrient condition of the bottom mud.

In Arthropoda, no species showed its dominance throughout the seasons. However, chironomous larva showed its dominance in all the seasons at site S2 and S4 except summer. Patil *et.al* (1983) pointed out that the presence chironomous and *Eristalis* species in the water body can classify the water body as eutrophic one. Verma and Dalela (1975) observed that the chironomous larvae were common in polluted bottom samples. The chironomides have then been recognizes as indicator of tropic status of pollution in various lentic systems (Saether, 1979), (Hul, 1987).

In present investigation Gastropods species showed their dominance on all the sites, in Gastropods *Lymnea accuminata* showed its dominance in all the seasons at site S2. However *thiara tuberculata* showed its dominance at site S1. *Pila globossa* showed its dominance at site S3. There is no clear

dominance of other species of Gastropods at the site specific sites.

Water hardness favors the growth of mollusca and zooplankton (Arce and Boyd, 1975). The statement is supported to present investigation. Anitha *et.al*, (2002) recorded 10 species of mollusca and stated that more number of mollusca species and their abundance associated with rich vegetation as well as slightly polluted nature of water bodies. Harman (1974) has also pointed out that mollusca are bioindicator of pollution

In the present investigation at all the sampling stations monsoon population was higher and was followed by winter and summer. Ashok Kumar and V.K. Saxena (2008) observed, the population of benthic fauna was high in the month of July (418.0 Units) . While minimum in December (38.0 Units/ m²) in river beas of Himachal Pradesh. Anitha *et.al* (2004) recorded the maximum population of Macro-zoobenthos during August 2000 at site I & II, where as minimum was recorded during the month of January and April in 1999 from Mir Alam Lake, Hyderabad, (A.P.).

As evident in the present study it seems that seasonal abundance of benthos is strongly influence by composition of sediments in terms of proportion of silts, mud and clay (Gupta, 1976) . It is suggested that proper measures are necessary to avoid contamination as rare indicator species are existed at site S2.

Table: 1.1 Seasonal Abundance and fluctuation of Macro-zoobenthos in Junona Lake

S.N.	Name of Species	2007-08 (Site S1)			2007-08 (Site S2)		
		Mon.	Win.	Sum.	Mon.	Mon.	Mon.
Annelida							
1	<i>Pristina aequiseta</i>	-	+	+	+	+	+
2	<i>Tubifex-tubifex</i>	+	+	-	+	+	+
Nematode							
1	<i>Diplogaster ficator</i>	-	+	+	+	+	+
2	<i>Rhabdolimus minor</i>	-	+	+	+	+	+
Arthropodo							
1	<i>Notonecta glauca</i>	+	+	-	+	+	+
2	Diptera larva	-	+	+	-	-	-
3	<i>Ophgomphus corixa</i>	-	+	-	+	+	+
4	Chironomous larva	+	+	-	+	+	+
Mollusca							
1	<i>Bellamyia bengalensis</i>	+	+	-	+	+	+
2	<i>Indorplanorbis exutus</i>	+	+	+	+	+	+
3	<i>Lymnaea accuminata</i>	-	+	+	+	+	+
4	<i>Thiara tuberculata</i>	+	+	+	-	-	-
5	<i>T. scraba</i>	+	-	-	-	-	-
6	<i>Pila globosa</i>	+	-	-	+	+	+
7	<i>Faunus ater</i>	+	+	-	+	+	+
8	<i>Heliosoma ancups</i>	-	+	+	+	+	+
9	<i>Ligumia latissima</i>	+	-	-	+	+	+

Table: 1.2 Seasonal Abundance and fluctuation of Macro-zoobenthos in Junona Lake

S.N.	Name of Species	2007-08 (Site S3)			2007-08 (Site S4)		
		Mon.	Win.	Sum.	Mon.	Win.	Sum.
Annelida							
1	Pristina aequisetata	+	+	-	+	-	-
2	Tubifex-tubifex	+	+	-	+	+	+
Nematode							
1	Diplogaster ficator	+	+	+	+	-	-
2	Rhabdolimus minor	+	+	-	+	-	-
Arthropodo							
1	Notonecta glauca	+	+	-	+	-	-
2	Diptera larva	-	+	-	+	-	+
3	Ophgomphus corixa	-	+	+	+	+	-
4	Chironomous larva	+	+	-	+	+	-
Mollusca							
1	Bellamyia bengalensis	+	+	-	+	+	-
2	Indorplanorbis exutus	-	+	-	+	-	-
3	Lymnaea accuminata	-	+	-	+	+	+
4	Thiara tuberculata	+	+	-	+	-	-
5	T. scraba	+	+	+	-	+	+
6	Pila globosa	+	+	+	+	+	-
7	Faunus ater	-	+	+	+	+	-
8	Heliosoma ancups	+	-	-	+	-	-
9	Ligumia latissima	+	-	-	-	-	+

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