

Studies of macro-benthos in Janala Lake, Chandrapur, Maharashtra, India

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Manuscript Details

Available online on <http://www.irjse.in>
ISSN: 2322-0015

Editor: Dr. Arvind Chavhan

Cite this article as:

Bele AS, Dongarwar CN and Telkhade PM. Studies of macro-benthos in Janala Lake, Dist-Chandrapur (M.S)., *Int. Res. Journal of Science & Engineering*, February, 2020, Special Issue A7 : 363-366.

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ABSTRACT

The study of aquatic ecosystem without the study of its benthos is incomplete. Many Benthic forms are detritivores and play a key role in the mineral recycling of organic matter and many benthic insect larvae and Oligochaetes are the major food sources for small and big bottom feeders. Many of them are sessile while some creep over a burrow in mud. Their number and distribution depends up on physico-chemical and biological characteristics of water. The present study is carried out to study Macro-benthos in Janala lake in the year 2014-15. In the present investigation, all together, 19 species of macro-invertebrates were identified. Identified species belongs to four major phyllas viz. Insecta, Gastropoda, Oligocheta and Nematoda. Group Insecta was represented by 07 species, Gastropods by 07 species, Oligocheta by 02 species and Nematoda by 03 species.

Keywords: Janala Lake, Macro benthos, lake, Water, Quality, bio- indicator.

INTRODUCTION

The study of limnology is of great importance to human generation as the biological characteristics specially study of Macro benthos. Benthological variables are particularly useful in measuring the water quality and such biological monitoring can provide resolution in space and time. Pollution is a major cause of environmental deterioration.

The use of Macro benthos as bio-indicator in the assessment of water quality realized better understanding in the field of limnology as compared to biotopes characteristics. Insect and Molluscs are the tolerant species in the changing condition of water ecosystem. Now a day, with the rapid increase in population, Industrialisation and over exploitation for different purposes, the quality of water has been deteriorating at an alarming rate, which ultimately results in depletion of aquatic biota. Several investigators from abroad and India have contributed their efforts in studies of diversity and density in fresh water, Tittizer and Kothe [16], Price [12], (Wetzel,[19], Krishna [7], Ansari[3], Kumar and Bohre [8], Anitha [2], Walmiki *et al.*,[18], Ramakrishna [13], Ahmad *et al.*[1], and Haider *et al.*,[6].

METHODOLOGY

The studies were carried out for 12 months from February 2014 and January 2015. The main aim of present study is to investigate the diversity of Macro benthos of Janala Lake. During the period of investigation, benthic samples were collected with the help of a tray type sampler (Size 30 × 25 × 50 m) with a sliding thin but hard iron plate covering the entire mouth of the tray. After sliding away iron plate the tray of the sample was placed firmly on the bottom by hand and then inserting the plate covered the mouth. A sample transferred into the volume was measured to sort out organism. Sample suspension was prepared in water and was filtered through 2 mm and 0.5 mm mesh size. The filtrate was transferred into a tray and added sugar solution (10 gms in 250 ml). Due to increase in the density of water benthic organisms floats on the surface and were picked-up with the help of dropper and preserved in 4% formalin for identification, Tonapi [17] and Pennak [11].

RESULTS AND DISCUSSION

The studies were carried out for 12 months from February 2014 and January 2015 at Janala Lake on diversity of macro benthos and are represented in table 1.1 and Photo plate 1.1

In the present investigation, all together, 19 species of macro-invertebrates were identified. Identified species belongs to four major phyllas viz. Insecta, Gastropoda, Oligocheta and Nematoda. Group Insecta was represented by 07 species, Gastropods by 07 species, Oligocheta by 02 species and Nematoda by 03 species. Similarly reported by, Gorai *et al.*, [5] reported 4 groups of benthic organisms consisting Gastropoda (03 species), Insects larvae (01 species), Oligocheta (08 species) and Nematode (01 species) from Rani Pond Dhanbad, Jharkhand. Ramakrishna [13] noted that taxonomic breakdown of the macro invertebrates indicated the dominance of diptera, followed by Annelida and Mollusca. Chironomus larva was the dominant Diptera. The Chironomus larva, Culex larva and anopheles larva can renew their oxygen supply directly from the atmosphere, they are thus unaffected by oxygen depleting waste. Srinivasrao [15] recorded total number of 13 species of macrobenthic-invertebrates belonging to three major groups. Annelids, Anthropods and Mollusca have been encounter in the littoral zone of Banjara lake. Walmiki *et al.*[18] reported taxonomic groups were observed among the benthic organism and at site1 showed the highest species richness while commonest taxons observed were gastropods, oligocheta and polychaets in lake Vembanad at Kottayam, Kerala.

In the present investigation, at all the sampling stations, winter population was highest and was followed by monsoon and summer. Sharma *et al.*[14] observed that benthic density high during winter season followed by summer and monsoon at site Kishanpura lake, Indore.

During the present investigation, Group Insecta consist of 07 species The species belonging to phylum Insecta was *Anisepts spp.*, *Dineutus spp.*, *Water scorpion*, *Eristalis spp.*, *Corixa spp.*, *Ophiogomphus spp.* and *Notonecta spp.* Meshram [9] recorded 06 Insecta species in Wadali lake Amravati, Maharashtra. Group Gastropods species showed their dominance on all the sites, *Gastropoda* consist of 07 species, The species belonging to phylum Gastropoda are *Bellamyia bengalensis (Lamark)*, *Thiara scabra*, *Lymnaea accuminata (Lamark)*, *Thiara tuberculata (Muller)*, *Unio spp.* *Indoplanorbis exustus (Deshayes)* and *Pila globosa*. Group *Oligocheata* was represented by only two species.

Table 1 : Macro-invertebrates diversity in Janala Dan during 2014-15

S.N.	Name of Macro invertebrates	Site - I	Site - II	Site - III	Site - IV
A] Insecta					
1	<i>Aniseps spp.</i>	++	++	++	--
2	<i>Dineutus spp.</i>	++	--	--	++
3	<i>Water scorpion</i>	--	++	--	++
4	<i>Eristalis spp.</i>	++	--	++	++
5	<i>Corixa spp.</i>	++	--	++	++
6	<i>Ophiogomphus sp.</i>	++	--	++	--
7	<i>Notonecta spp.</i>	++	--	--	++
B] Gastropoda					
8	<i>Bellamya bengalensis (Lamark)</i>	++	++	--	++
9	<i>Thiara scabra</i>	++	++	--	++
10	<i>Lymnaea accuminata (Lamark)</i>	--	++	++	++
11	<i>Thiara tuberculata (Muller)</i>	--	--	++	++
12	<i>Unio spp.</i>	++			++
13	<i>Indoplanorbis exustus (Deshayes)</i>	++	++	++	--
14	<i>Pila globosa</i>	++	++	++	++
C] Oligocheta					
15	<i>Limnodrilus hoffmeisteri</i>	--	++	--	++
16	<i>Tubifex tubifex (Muller)</i>	--	++	--	++
D Nematoda					
17	<i>Rhabdolimus minor.</i>	++	++	++	--
18	<i>Diplogaster ficator</i>	--	++	--	++
19	<i>Planeria spp.</i>	--	++	--	++

The species belonging to phylum Oligocheta are *Limnodrilus hoffmeisteri* and *Tubifex- tubifex* (Muller). Brinkhurst and Cook [4] observed that the abundance of tubeficids relative to various other species of worms is of particular importance in pollution studies. *Oligochaetes Tubifex* species and *Limnodrilus Hoffmeisteri* are known to be good indicator of pollution. Group Nematoda was represented by only three species. The species belonging to phylum Nematoda are *Rhabdolimus minor*, *Diplogaster ficator* and *Planeria spp.*, Similar, observation made by, In the present study, the benthos is dominated by Gastropods and Insecta groups in the littoral zones rich aquatic vegetation. Insecta dominated in diversity throughout the study period followed by Gastropoda species, Oligocheta species and Nematoda species. 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.

CONCLUSION

To summaries on the basis of water quality and the benthic macro-invertebrate studied, Janala dam water can be described as a free from domestic activities. Paul and Nandi [10] stated that the abundance of benthic fauna greatly depends on physical and chemical property of the substratum. Aquatic invertebrate serve as a primary food source for many fishes. They are the preferred indicator of long term water quality due to their limited mobility. The zooplankton forms a link between phytoplankton, macro-invertebrates which in turn provide food to fishes and aquatic birds.

Conflicts of interest: The authors stated that no conflicts of interest.

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