

Diversity of Benthic Fauna of Nagrala Lake, Bhadrawati, District Chandrapur(Ms), India.**Bhute, K. B¹. and Harney, N.V².**

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Abstract

Freshwater lakes are integral part of urban ecosystem and provide numerous benefits to human beings directly or indirectly. Benthic fauna plays important roles in keeping freshwater ecosystems functioning properly. Just about anywhere you go on the planet; there is some kind of insect that will live in almost any place that stays wet for a week or so.

This study was aimed to study the diversity of benthic fauna of Nagrala lake near Bhadrawati of Chandrapur district. The benthic fauna was collected from the lake during June 2016 to May 2018. During the study, 20 species of benthic fauna belonging to 10 groups of class/phylum were found.

Key words- Nagrala lake, Benthic fauna, Diversity

Introduction

Benthos is a crucial component of biotic life found in shallow water estuarine and coastal marine ecosystems. Macro-benthos are the bottom dwelling organisms found in all the aquatic ecosystems of the world and which differ from ecosystem to ecosystem. Benthos plays a major link between primary producers, decomposers and higher trophic levels.

Aquatic insects or water insects live some portion of their life cycle in the water. They feed in the same ways as other insects. Some diving insects, such as predatory diving beetles, can hunt for food underwater where land-living insects cannot compete.

Benthos is the community of organisms that live on, in, or near the seabed, river, lake, or stream bottom, also known as the benthic zone. India is one of the many reasons (Merritt, R.W.et. al., (2008) and are the primary bio-indicators of mega biodiversity countries in the world and occupies the freshwater bodies such as lakes, ponds, wetland, streams ninth position in terms of freshwater mega biodiversity and rivers Mittermeier, R.A.(1997). They serve various

purposes such as food of Literature review suggested that this is the first study on fishes and other invertebrates, as vectors of pathogens to the quantitative assessment of aquatic insect diversity of both humans and animals.

Insects constitutes about 70% of all known species of animals are insects. Although they are mainly land animal, they are widespread and adapted to all types of environment. They are also the only invertebrates that can fly (Voshell, 2002). Most insects feed on plant materials, while some feed on animal tissues and wastes. Aquatic insects contribute significantly to fresh water ecosystems, one of many groups of organisms that, together, must be considered in the study of aquatic ecology. As such their study may be a significant part of understanding the ecological state of a given ecosystem and in gauging how that ecosystem will respond to stress.

Aquatic insects and other bottom-dwelling organisms in freshwater systems are also monitored in order to gauge subtle and profound effects that changes in water quality have on aquatic life. Many species of aquatic insects are very susceptible to pollution or alteration of their habitat. In fact, aquatic insects are the group of living things used most commonly for monitoring the health of aquatic environments. The aquatic insects also reside in

surface, column and bottom zone of fresh water lakes.

Nagralla lake is 2 km away and situated on the north side of Bhadrawati at about 205 m. above mean sea level and is at 20° 03' 51.93" N latitude and 79° 09' 55.47" E longitude. It receives the water from the surrounding catchment areas during the monsoon period. The area of Nagralla lake is spread over 31.36 acres. The depth of water is 20 feet during the monsoon and 7 feet during the summer season.

Material and Methods

Benthic samples were collected using Eckmen Dredge. The collected bottom sediment/mud is transformed to a measuring cylinder or bucket and the volume is measured. The organisms in sample were separated by preparing a suspension in water which is filtrated through 2 to 0.5 mm mesh size sieve. The filtered residue is placed in an enamel tray and sugar solution (10 gm in 250 ml) is added. Due to an increase in water density by this addition benthic fauna move up which are collected with the help of a dropper, forceps or brush. The sorted organisms are preserved in 4% formalin or 70% alcohol from the field and are transferred to the lab in polythene bags.

The identification of organisms up to species level was done with the help of standard keys (Tonapi, 1980).

Population density is calculated as follows :-

$$\text{Population (organisms / m}^2\text{)} = N/A \times 10^4$$

Where N = number of organisms / sample

A = Area of sampling (cm²)

Aquatic insect organisms were seen floating on the surface which were collected with the help of forceps and net. All the organisms were preserved in 5% formalin. The identification is done using standard literature viz. Pennak(1978), Tonapi(1980), Vazirani (1984) and Thirumalai *et. al.* (1998).

Result and Discussion

Benthic macro invertebrates are best indicators for Bio-assessment. The abiotic environment of the water body directly affect in the distribution, population density and diversity of the macro benthic community. Benthic fauna are especially of great significance for fisheries that they themselves act as food of bottom feeder fishes.

In the present investigation 20 macroinvertebrate species were recorded from ten different classes in the three different sites of lake under investigation. In class Nematoda, *Diplogaster factor* and Annelids like *Pherentima* and *Hirudinaria* showed their presence in all the three sites.

Telkhede, *et.al.*, (2008) collected species of *Rhabdolaimus* and *Diplogaster factor* from Masala lake at Duragapur of Dist. Chandrapur. S.B. Zade and S.R. Sitre (2012) observed 13 macro benthic species belonging to three phylum in a polluted urban Naik lake of Nagpur city. Shashikant R. Sitre (2013) founded *Ceratophyllum sp.*, *Hydrilla sp.* and *Nelumbo sp.* in water reservoir of Bhadrawati tehsil in Chandrapur District, S.S. Lonkar and G.T. Kedar (2014) recorded 30 species of macro benthic invertebrates belonging to four phylum from three Urban lakes of Nagpur, in the Ambazari lake showed high species diversity with 28 species while 26 species were recorded from Futala lake while 24 species were recorded from Gandhisagar lake. A. L. Shelekar, N. V. Harney(2017) reported 34 species of benthos from Gorja Lake Near Bhadrawati Tahsil, District Chandrapur, Maharashtra, India. Pimpalshende Atul K and Sitre Shashikant R(2018) recorded 25 species of benthic fauna in freshwater lakes of Pombhurna Tehsil of Chandrapur District, MS, India. AK Singh, Rani Kumari and Arun Kumar(2019) reported 26 species of macroinvertebrate in floodplain lakes of North Bihar, India.

Anitha, *et.al.*, (2004) stated larvae of mosquito and *chironomous* are considered as pollution indicator by several authors. Their dominant presence in site C indicates its slightly polluted nature. In site A and site C, *Lymnaea sp.* are abundantly recorded as compare to site B.

Vivipera bungalensis and *Corbiculla reguaris* are found in site C but both the species are less from site A and site B probably due to its high contamination. Kiran (2007) founded these fromtwo polluted lentic water bodies of Bhadrawati taluka, Karnataka.

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Table No. 1 : Distribution of Benthic forms of Nagrala lake during 2016-18

Sr. No.	Name of Forms	A	B	C
1	<i>Belostoma sp.</i>	+- -	+ - -	+ - -
2	<i>Chironomous larva</i>	+++	+++	+- -
3	<i>Corbicula regularis</i>	- - +	+++	+++
4	<i>Dinecutus sp.</i>	- - +	+ - -	+ - -
5	<i>Diplogaster ficator</i>	+++	+++	+++
6	<i>Dragon-fly</i>	- - +	- - -	+++
7	<i>Dugesia tigrina</i>	+++	+ - -	+++
8	<i>Endoplanorbis sp.</i>	+ - -	- - -	+ - -
9	<i>Gerris(pond skater)</i>	- - -	+++	+++
10	<i>Glessula notigena</i>	- - +	- - -	+++
11	<i>Hirudinaria granulosa</i>	+++	+ - -	+++
12	<i>Lymnaea sp.</i>	+ - -	- - -	+ - -
13	<i>Mosquito larva</i>	- - -	+++	+++
14	<i>Nepa sp.</i>	+ - -	+ - -	+ - -
15	<i>Peltodytes sp.</i>	+++	- - -	+++
16	<i>Pheretim a spostauma</i>	+++	+++	+++
17	<i>Pila globosa</i>	+ - -	+ - -	+ - -
18	<i>Tubifex sp.</i>	- - -	+++	+++
19	<i>Vivipera bungalensis</i>	+++	- - -	+++
20	<i>Water mite</i>	+++	+++	+++