



## BIODIVERSITY OF BENTHIC MACROINVERTEBRATES IN NAVEGAON BANDH NATIONAL PARK RESERVOIR DIST. GONDIA, MAHARASHTRA

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### ABSTRACT:

Benthic macro invertebrates remain undiscovered or under described partly because of insufficient exploration and partly because of their often small sizes. To understand the functional role and ecological importance of benthic macro invertebrate fauna the study of diversity of benthos from the freshwater lentic ecosystem of Navegaon bandh National park reservoir was carried out for the period of two years (2010-2012)

**KEYWORDS:** Biodiversity, Benthic macro invertebrates, Navegaon National Park

**INTRODUCTION:** The community of organisms occupying the bottom of a water body is called the Benthos. The functional role of macro benthic communities in the trophic dynamics of the reservoir ecosystem is well acknowledged. It includes benthic macro invertebrate communities of Nematodes, Oligochaetes, Insects and Molluscs (Gastropods & Bivalves). The composition, abundance and distribution of benthic organisms over a period of time provide an index of the ecosystem. In recent years there is a greater emphasis world over for better understanding of benthic environment, its communities and productivity and this has led to increased exploitation of many inland water bodies.

The invertebrate communities respond to change in water quality, integrates impact over a period of time and presence or absence of species can be an indication of specific environmental condition (Anitha et al., 2004). Benthos are important in the secondary productivity of fresh water Lakes and playing significant role in exchange of autochthonous and allochthonous material in Lake ecosystem. It has a great ecological importance because they form the food of fishes and their productivity plays an important role in sustaining food chain and web in aquatic ecosystem.

Further the qualitative studies of benthic macro invertebrates have also been stressed by many workers (Dinakaran et al., 2008; Sharma et al., 2007; Anitha, 2003; Ryali, 2004; Naidu, 2005; Singh, 1994; Sisodia et al., 2007 and Garg et al., 2009).

### MATERIAL AND METHODS:

**Study Site:** Navegaonbandh Reservoir or Lake is situated in Navegaon National Park located at 20° 45' to 21° 2' North Latitude and 80° 5' to 80° 15' East longitude representing

the lentic system. It is an important IBA, harbors variety of organisms.

### Methodology:

During the study period, monthly samples from two study sites were collected for qualitative estimation of benthic fauna. The mud sample was collected with Eckmann dredge and was transferred to laboratory in polythene bags. To sort out organisms the suspension is prepared in water and is filtered through three nets having different mesh size kept one on another. Filtered residue is transferred in to a tray and sugar solution added (10 gms in 250 ml). Due to increase in the density in water, benthic organisms floated on the surface and were picked up with the help of dropper and preserved in 4 % formalin for identification up to species level by following the keys from Edmondson, (1959); K.Vanmala Naidu, (2005); Pennack, (1978); Tonapi, (1988) and Mitra & Day, (2005). Photography was done by Digi-2 Pro Labomed camera attached to computer.

### OBSERVATIONS AND RESULT:

Benthic macro invertebrates were represented by 16 species and consisted of members from Oligochaeta belonging to 01 family and 02 genera; Insecta belonging to 05 families and 05 genera; Gastropoda belonging to 05 families and 06 genera and Pelecypoda belonging to 01 family and 01 genus. The species composition is illustrated in the table: 1 and Plate: (I & II).

**Table: 1:**Diversity of Benthic Macro invertebrates Recorded in Navegaon Lake

Sr.No	Species	Stations	
		S1	S2
	Phy: Annelida Class : Clitellata Subclass: Oligochaeta Order : Tubificida <b>Family:</b>		

Sr.No	Species	Stations	
		S1	S2
	<b>Tubificidae</b>		
01.	<i>Tubifex tubifex</i>	+	-
	Sub-Family: Branchiurinae		
02.	<i>Branchiura sowerbyi</i>	+	-
	Phy: Arthropoda Class: Insecta Order: Diptera (Flies) <b>Family: Simulidae</b>		
03.	<i>Simuliaum larvae</i> (Black flies)	+	-
	<b>Family: Chironomidae</b>		
04.	<i>Chironomus larvae</i> (Midges)	+	-
	<b>Family: Tabanidae</b>		
05.	<i>Tabanuslarvae</i> (Horse flies)		
	Order: Hemiptera <b>Family: Naucoridae</b>		
06.	<i>Pelocoris femoratus</i>	+	+
	<b>Family: Nepidae</b>		
07.	<i>Laccotrephes maculatus</i>	+	+
	Phy: Mollusca Class: Gastropoda SubClass: Prosobranchia Order: Mesogastropoda <b>Family: Viviparidae</b>		
08.	<i>Vivipera bengalensis</i>	+	+
	<b>Family: Thiaridae</b>		
09.	<i>Melania striatella tuberculata</i>	+	-
10.	<i>Melania scabra</i>	+	+
11.	<i>Faunus ater</i>	+	-
	<b>Family: Ambullaridae</b>		
12.	<i>Pila globosa</i>	+	+
	Subclass: Pulmonata Order: Basommatophora <b>Family: Lymnaeidae</b>		
13.	<i>Lymnaea acuminata</i>	+	+
14.	<i>Lymnaea luteola</i>	+	+
	<b>Family: Planorbidae</b>		
15.	<i>Planorbis exustus</i>	+	+

Sr.No	Species	Stations	
		S1	S2
	Class: Pelecypoda Subclass: Order: <b>Family: Unionidae</b>		
16.	<i>Lamiellidens corrianus</i>	+	-

#### DISCUSSION:

In the present investigation, the benthic macro invertebrates consisted of Oligochaetes, Insects, Gastropods & Bivalves.

Among Oligochates, two species i.e. *Tubifex tubifex* and *Branchiura sowerbyi* were collected from the site I (S1) of the Lake and not from the site II (S2).

Many workers considered benthic Oligochaetes as indicators of pollution Mukherjee & Nandi (2004) recorded *Limnodrillus* spp and *Branchiura sawerbyi* in Subhas Sarovar Lake, Kolkata. Aston (1973) and Marshal (1978) stated that occurrence of these species may be attributed to the increased eutrophication of the lake or to the increased sedimentation of organic matter.

Raposeiro et al., (2009) reported the species of Tubificidae, *Branchiura sowerbyi* from the Ribeira Quente stream, Sao Miguel, Azores, Portugal and according to him, *B. sowerbyi* lives in aquatic sediments associated with shallow, stagnant or slowly flowing waters and the presence of this species is probably due to human activity, and that just one individual was sampled might indicate that this is an early stage of invasion.

Thus in the present investigation though the Lake is oligotrophic, occurrence of one specimen of *Branchiura sowerbyi* at S1 particularly during late summer indicates that the site, and in particular the marginal areas might be slightly polluted due to decomposing organic material of anthropogenic origin as this site is largely visited by the tourists during their visit to the National park.

Sameera Siraj et al., (2010) from wetlands of Kashmir reported that *Tubifex* spp are true representative of eutrophic condition and were typical constituents of sediment with abundant organic material. In the present investigation also their collections from S1 during late summer also indicate that the said site has more organic decomposing material of anthropogenic origin, and though the Lake is not eutrophic.

Aquatic Oligochaetes are extensively studied by K. Vanamala Naidu (2005). The biodiversity of benthic macro invertebrates pertaining to Oligochaetes are studied by Sarkar & Krishnamurthy (1977).

In the present investigation the aquatic insects, *Simulium* larvae, *Chironomus* larvae, *Tabanus* larvae, *Pelocoris femoratus* and *Laccotrephes maculatus* were recorded.

Among them *Simulian* larvae, *Chironomous* larvae, *Tabanus* larvae were collected only from site I (S1) and *Pelocoris femoratus*, *Laccotrephes maculatus* were collected from both the sampling sites of the Lake.

The indicator species such as *Chironomous* larvae was recorded only once during the entire study period from site I (S1) of the Lake, indicates that the said site has more organic enrichment during late summer due to anthropogenic activities.

Archana Rani (2004) recorded various species of Chironomids have recognized as indicators of trophic status of water body (Moore, 1978; Hul, 1987).

Chironomids are known to be pollution tolerant (Milbrink, 1980) with high organic nutrients (Kaushik et al., 1991, Pandit, 1992).

Among the Gastropods *Vivipera bengalensis*, *Melania tuberculata*, *Melania scabra*, *Faunus ater*, *Pila globosa*, *Lymnaea acuminata*, *Lymnaea luteola* & *Planorbis exustus* were recorded during the study period. Among the Pelecypod only *Lamiellidens corrianus* spp was collected from S1 only.

*Lymnaea* spp, *Melania* spp, *Planorbis* spp were collected only from site I (S1) of the Lake, but were numerically not abundant, which indicates that site I (S1) is slightly polluted due to anthropogenic pressure at the marginal area. Similar observations were reported by Das et al., (1978). Arvindkumar (1999) also reported *Melania* spp from Santhal pargana, Bihar.

In the present investigation Molluscs showed their dominance in the both sampling sites of the lake. The richness of Molluscs presently observed may be attributed to the cumulative effect of slightly alkaline nature of water and Macrophytic vegetation which provide both food and shelter, as it has earlier been documented by Tonapi (1980) and Pennak (1989).

Water temperature exhibited a positive correlation with Molluscs during the present study. This shows that increase in

temperature within the observed range favors the growth of Molluscs (Michael, 1968). Dutta & Malhotra (1986), Malhotra et al., (1996) also recorded a positive correlation between Molluscs and temperature.

#### CONCLUSION:

Study of benthic fauna did not indicates the indicator species, except the occasional occurrence of *Branchiura sowerbyi*, a indicator species from benthic macro invertebrates, this species was recorded during summer at the sampling site which has a great influx of the tourists and which add organic material of anthropogenic origin. Thus the lake is unpolluted or Oligotrophic and therefore does not warrant immediate steps for the conservation of water quality.

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