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MOLLUSCAN DIVERSITY IN SAIGATA LAKE OF BRAMHAPURI TALUKA, DIST-CHANDRAPUR, MAHARASHTRA, INDIA

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Abstract:
Many freshwater molluscan species are at the risk, due to loss and degradation of aquatic habitats by anthropogenic activities. They were frequently considered as a bioindicator organisms,and there productivity play important link in food chain of aquatic fauna . In present study molluscan species were collected from Saigata lake near Bramhapuri from July 2014 to December 2014. During the present investigation, a total of 19 molluscan taxa belonging to 2 classes, viz., gastropoda and bivalvia, 14 families were recorded. Out of the 19 species, 15 gastropods and 4 bivalves were recorded. Among the gastropoda group, *Pila globosa* was most dominant followed by viviparous *Bengalensis, lymnaea acuminate*, *Lymnea auricularia*, among bivalvia the dominant species was *Pisidium personatum*, followed by, Lamellidens marginalis, *Pisidium casertanum* and *Unio crassus*. The study indicates that the molluscan community could be explored for possible use as biomonitors of pollution in the lake.
Keywords: mollusca, gastropoda, bivalvia, biomonitor, saigata.

Introduction

Several investigation were undertaken on major benthic animal group of freshwater system,notable contribution to our knowledge of molluscan fauna have been made by several authers.In view of the rapid and radical degradation of aquatic habitats worldwide, an increasing amount of research is being undertaken to determine the specific composition in benthic communities. Growing efforts are being made to describe, map and understand biodiversity patterns at a wide range of spatial scales (Gray et al., 1990; Gray, 2001).
Aquatic ecosystem provides a home to many species including phytoplanktons, zooplanktons, aquatic plants, insects, molluscans etc. They are organized at many levels from smallest building blocks of life to complete ecosystems, encompassing communities, populations, species and genetic levels. All aquatic ecosystems around the globe are generally colonized by the representatives of phylum Arthropoda and Mollusca. Benthic invertebrates occupy the bottom of water body. The functional role of benthic communities in the trophic dynamics of river ecosystem is well acknowledged. The composition, distribution of benthic organisms over a period of time provide index of the ecosystem. In recent years, there is a greater emphasis world over for better understanding of benthic environment. Clarke (1979) attempted to show the utility of molluscs in primary classification of the rivers in their various trophic status stages. Choubisa (1992) has collected 32 species of molluscs from various freshwater habitats of southern Rajasthan. Harman (1974) has also pointed out that molluscs are bio-indicators of freshwater pollution.

Molluscans are of great significance because they form the food of fishes and their productivity play an important link in the food chain. Benthic organisms are detirivores and form an important link in the food chain. On account of their ability to convert low quality and low energy detritus into better quality food for higher organisms in the food web with the unfolding of importance of benthos in food chain, benthic productivity has been correlated with fish resources. Molluscans communities are good indicators of localized conditions, indicating the water quality. The presence of thriving populations of molluscan indicates the land is not acidic; hardly molluscs survive beyond a pH of 5. (Boycott 1934).

Several workers have pointed out that macrobenthic fauna provides a valuable tool as indicator of past and present water quality from pollutional and in general stress viewpoint (Hussainy and Abdulappa, 1967; Rama Rao *et al.*, 1978; Sinha *et al.*, 1989, 1991). Harman (1974) has pointed out that molluscs are bioindicators of freshwater pollution. Compared to large number of studies conducted in Europe and USA on the use of benthic macroinvertebrates in the monitoring and assessment of water quality, very few investigations have been carried out in India (Gupta 1994; Sivaramakrishnan *et al.*, 1996).

Materials and Methods

Five sampling sites were selected that represent a range of unimpacted to impacted reaches in the lake which is located at 19.80

longitude and 20.61 latitude. The mollusks were collected by taking three kick net samples from a unit area the contents of the nets were pooled and preserved in 70% ethanol and were identified.

Result

The distribution of macro benthos fauna in normal condition has been reported to be dependent on the availability and distribution of preferably food items. In fact, their capacity to exploit areas with optimum food supply might be explained by their abundance (Grimas 1965). During the present investigation carried out, a total of 19 molluscan taxa belonging to 2 classes, viz., Gastropoda and Bivalvia, 14 families were recorded. Of the 19 species, 15 gastropods and 4 bivalves were recorded. (**Table.1**)

Discussion

Molluscs, a group of most diverse and dominant benthic fauna in water bodies, perform a key role in the functioning of aquatic ecosystem. Molluscans are of great significance because they form the food of fishes and their productivity play an important link in the food chain. Molluscans communities are good indicators of localised conditions, indicating the water quality. The freshwater ecosystems in india harbour a rich diversity of molluscs, representing 212 species belonging to 21 families,out of these, 164 species were recorded from rivers and streams (Subba Rao, 1993). The presence of thriving population of molluscan indicates the land is not acidic; hardly molluscs survive beyond a ph of 5 (Boycott, 1934). Biological monitoring of rivers using macro invertebrate is accepted as a useful tool for the assessment of water quality (Hellawell, 1986).

They are represented in freshwater bodies by only two classes, gastropoda and pelecypoda (Makie 1998) and a group of most diverse and dominant fauna in water bodies. They perform key role in functioning the aquatic ecosystems. The availability of maximum molluscs during summer months could be related to two important ecological phenomenons. (a). The maximum abundance of decomposers settled organic matter and macrophytes on the bottom of water body and, (b). Increased water temperature, activating the process of decomposition of these organic sediments (Malhotra et al 1996) it seems true that the fluctuation brought about by these process in that water body study, create a very conductive micro as well as macro environment for the health growth and multiplication of the molluscan fauna. Higher abundance of Molluscans with increased water, temperature and decomposed organic matter has been also reported by Bath et al (1999).

In the present study *Pila globosa* was most dominant followed by *viviparous bengalensis*, *Lymnaea acuminate, Lymnea auricularia***,** *Bellamya crassa***,** *Succinella oblongaBorysthenïinae starobogatov, Galba truncatula* **,***Vallonia pulchella***,** *Perpolita hammonis***,** *Archimediella fastigiata, Physella gyrina, Marisa cornuarietis*. Among Bivalvia the dominant species was *Pisidium personatum*, followed by, *Lamellidens marginalis*, *Pisidium casertanum* and *Unio crassus*. *Viviparous bengalensis* was the second largest dominant species during the present observation. Micheal (1968) recorded a peak of the population of *Vivipara* in April month in West Bengal; such peak population was also observed in May and June month in Mandleshwar station. Several authors (Shrivastava 1956, 1959; Krishnamoorthi 1979; Michael 1968; Sharma (2006) and Gupta 1976) also observed *Vivipara bengalensis* as one of the major species among the benthic fauna. Satyamurti (1960) observed *V. bengalensis* inhabits polluted water bodies in large numbers especially during hot season, buries itself in the mud up to 15 cm depth to aestivate and may be found dead on the bank. The population density of molluscan gets decreased in the period of post monsoon season. Oliver (1960) explained that this may be due to the sudden inflow of water from the catchment area or water inlet or outlet system. The maximum diversity of Molluscans was found in summer season. One of the most important factor which seems to determine the habitat and activities of molluscs is the amount of dissolved salts especially calcium carbonate in water, which is essential material for shell formation (Zahoor et al,2010). Pennak (2004) reported that the dissolved oxygen is the limiting factor for the distribution of molluscs, absence of molluscan population in lake or river. The diversity of molluscan were changes in different stations during present study this was due to the above factors such as dissolved oxygen, calcium carbonate etc. The bivalve fauna was less rich with 4 species only. Of these, *Lamellidens marginalis* was the most common, being found in 2,3 and 5 stations. The other three species, viz., *Pissidium personatum, Pissidium casertanum* was encountered in 3 sites, while *Unio crassus* is also was recorded in a three sites. Thus the present study shows that both gastropod and bivalve communities found to

inhabit the different sites of Saigata lake represented by a range of species during differential response to habitat degradation and pollution.

Table.1

Taxa	Site 1	Site 2	Site 3	Site 4	Site 5
Class – Gastropoda					
Family- Viviparidae					
1.Pila globosa	+	+	+	+	+
2.Vivipara bengalensis	_	+	+	_	+
3.Bellamya crassa	+	_	_	+	+
Family- Succineidae					
4.Succinella oblonga	_	_	+	_	+
Family- Valvatidae					
5.Borystheniinae starobogatov	+	_	_	+	_
Family- Lymnaeidae					
6.Lymnaea acuminate	_	_	+	_	+
7.Lymnea auricularia	+	_	+	_	+
8.Galba truncatula	_	+	_	+	+
Family -Valloniidae					
9.Vallonia pulchella	+	_	_	_	+
Family - Oxychilidae					
10.Perpolita hammonis	+	_	+	+	_
Family Turritellidae					
11.Archimediella fastigiata	_	+	_	+	_
Family – Physidae					
12.Physella gyrina	+	_	_	+	_
Family - Ampullariidae					
13.Marisa cornuarietis	_	+	_	+	+
Family – Planorbidae					
14.Helisoma anceps	+	_	_	+	_
15.Planorbula armigera	_	+	+	_	+
Class – Bivalvia					
Family- Sphaeriacae					
16.Pissidium personatum	_	_	_	+	+
17.Pissidium casertanum	_	+	_	+	_
Family- Unionidae					
18.Unio crassus	+	_	+	_	+
19.Lamellidance marginalis	_	+	+	_	+

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