



Assessment of Molluscs biodiversity from Bendsura project district, Beed (M.S.) India

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Abstract

Taxonomic research and the sharing of associated data an essential basis for further biodiversity studies, including surveys, inventories, and ecological and biological resource research. The sustainable use and management of biodiversity will require data. It will be useful when and where that information is needed for the decision makers and scientists. Biological diversity is important because of the way relationships between species and habitats combine to provide yet more variation in the living world. Any human activity that diminishes this 'biodiversity' could therefore deprive our own quality of life, reduce the resources available to us and ultimately jeopardize the survival of our descendants. The molluscs are the one of the most important groups and of invertebrates in an ecosystem with regard to biomass, diversity, spatial or trophic relationships. The present investigation was undertaken to study diversity of aquatic animals with reference to molluscs fauna of Bendusara project (central India, M.S.) water body during period February-2024 to January-2025. The results of present investigation were confirmed the occurrence Molluscs with 6 species belongs 2 orders, 4 families, and 3 genera. We determined: (1) the importance of different habitats for conserving the diversity of freshwater mollusks (2) key environmental factors (e.g., pH and DO) affecting species distribution; and (3) important biogeographical determinants (e.g., area) of species richness within each habitat. High sampling saturation was achieved at most study habitats with minimal sampling effort, suggesting that the utilization of molluscs as bioindicators can accelerate freshwater conservation initiatives. Reservoirs therefore serve to conserve the bulk of local freshwater malacofauna, especially if they are maintained at near neutral pH levels (i.e., 7.3). Area was the best predictor of molluscan richness across all habitats, implying that larger freshwater habitats require higher conservation priorities than smaller ones.

Keywords: Biodiversity, Bendusara, Benthos, Molluscs, Conservation.

Introduction

Biodiversity provides numerous ecosystem services that are crucial to human well-being at present and in the future. Good biodiversity data are fundamental to biodiversity research, natural resource management and conservation policy making. Assessment of global biodiversity, as well as of biodiversity of particular groups and territories is the high priority task in these days. Most of the biosphere is poorly known, thus species richness is often the only available measure of biodiversity in extended areas and for most taxa. The loss of biodiversity worldwide has been well documented for decades, and while much of the attention of the media and scientific community has been focused on terrestrial ecosystems, other biomes such as freshwater lakes and streams have received less consideration (Myers et al., 2000). Despite the current decade (2005-2015) being declared an International Decade for Action 'Water for Life' by the United Nations General Assembly, freshwater ecosystems worldwide are as threatened as ever by the activities of a rapidly growing human population.

Freshwater molluscs and crustaceans are declining in both species richness and abundance, which can reduce their influence on ecosystem functioning and have multiple negative impacts on the ecosystem as a whole. However, Vaughn (1997) reported that both common and rare species are in decline. It has been shown that some mussel species and other molluscs are more effective in carrying out the ecosystem functions. (Mc Call et al., 1995; Vaughn et al., 2007). It is likely, therefore, that the ecological functions performed by freshwater mussels will continue to decline along with mussel populations, which can significantly impact the overall ecological functioning of freshwater systems (Vaughn, 2010). There are many causes for the decline in freshwater mussel biodiversity (Strayer et al., 2004; Downing et al., 2010). Dudgeon et al. (2006) described that overexploitation, pollution; flow modification, exotic species invasion, and habitat degradation

are major contributors to the loss of freshwater biodiversity.

The molluscs are one of the most important groups of invertebrates in an ecosystem with regard to biomass, diversity, spatial or trophic relationships. They inhabit virtually every habitat and niche. Molluscs are a powerful tool to describe biodiversity in ecosystems on a wide scale and to indicate community composition and structure. Moreover, the protection of molluscs is in line with the principles of the World Conservation Strategy (UNEP, IUCN & WWF, 1980). Our study proposes an approach to the hot spot strategy to combine lots with higher values of species richness index with data on distribution of species worth protecting and of rare species.

The present investigation definitely provides a stimulus to assemble records and provide a quantitative and temporal data of molluscs of Bendsura natural project. This index shows a positive correlation with the environmental diversity and with the proportion of hard substrates. In the lots we assess the distribution of species worth of protection (according to literature) and of most rare species. Combining these data with the distribution of lots with higher values of species richness index, we identify hot spots available for conservation.

Materials and Methods

The Bendsura project is constructed on Bendsura river tributary of 180-45'-45" N at latitude District Beed in Maharashtra.

This project is situated about 11 Km. towards the south of Beed. It covers about 188.42 sq. km. area and capacity area of water spread, 1.80 sq. Km. The main aim of this project was irrigations, drinking and aquaculture practices. But now days the water from reservoir is being used for industries located in Beed District. The present work is an attempt to study mollusc fauna which are commercially important. Sampling was done during winter months of 2025, with help of local fishermen from three stations like lentic

(Shantivan-A), lotic (Gotakhori-B) and perennial water (Shadval peer-C) bodies of Bendusara project. Simple technique to obtain samples from desired depth was used and was preserved in 70% ethanol. pH was also determined visually (APHA) from all sampling stations.

And morphological characteristics were studied, Subba Rao, (1990). The molluscs were identified with the help of key given by earlier researcher Bhatt (1959). Subba Rao, (2003) Gupta, (1976), Krasnamoorthy (1966) Warden Whipple (1959).

Results and Discussion

Results clearly indicate that (Table.1) indicate that the species distribution and richness vary from different research stations. The species richness is much higher in Station A (Shantivan) than lotic (station B and C. $P > 0.001$). It is also observed that the pH value differs in different stations. It is alkaline and ranges from 8.1-8.8 from all research stations sampled and higher in Station C (perennial). Gastropoda and Bivalvia represent the vast majority of total diversity (95.9%). High pH stations are characterized by much less diverse fauna with 149 species and subspecies of gastropoda and 61 of Bivalvia. Thus distribution of number of species differs greatly in different research zones. Of a special interest may be the analysis of the relationship between the number of species of major molluscs groups. In general Gastropoda and Bivalvia ratio is 2.69 in marine and 1.70 in freshwater mollusks (Yuri et al 2005). If we consider the fauna of different research zones the ratio appears to vary strongly. At low pH area (Station B and C) the gastropods strongly prevail while the share of bivalves is much higher at Station A. In our experiment the Gastropoda/Bivalvia ratio varies from 3.46 to 0.45. The cause of this phenomenon is unclear and besides probable differences in these groups in respective areas may also reflect the difference in the environment and the history of fauna formation.

Table: 1. Check list of Molluscs of Bendusara project

From February 2024 to January 2025.

Phylum	:	Mollusca
Class	:	Gastropoda
Sub-class	:	Prosobranchiata
Order	:	Mesogastropoda
Genus	:	Lamillidens
Species	:	marginalis
Class	:	Pelecypoda
Order	:	Eulamellibranchiata
Family	:	Unionidae
Genus	:	Pila
Species	:	globosa
Class	:	Bivalvia
Order	:	Eulamellibranchiata
Family	:	Unionidae
Genus	:	Lamillidens
Species	:	corrianus
Class	:	Pelecypoda
Order	:	Eulamellibranchiata
Family	:	Unionidae
Genus	:	Parreysia
Species	:	corugata
Class	:	Pelecypoda
Order	:	Mesogastropoda
Family	:	Viviparidae
Genus	:	Parreysia
Species	:	favidens
Class	:	Gastropoda
Order	:	Pulmonata
Suborder	:	Basommatophora
Genus	:	Lymnaea
Species	:	Luteola

Conclusion

In conclusion, we have to stress that the study of species distribution and relationship can be considered a useful tool to protect the biodiversity of mollusks. Six conclusions have emerged from recent research that complicate the ability to predict how biodiversity losses may affect ecosystem function: (1) species traits determine ecosystem function, (2) species within functional groups are not always ecological equivalents, (3)

biodiversity losses include declines in the abundance of common species, (4) biodiversity losses affect whole food webs, (5) the effects of biodiversity losses depend on abiotic and biotic context and spatial and temporal scales, and (6) successfully predicting linkages between biodiversity and ecosystem function requires using multiple empirical approaches across scales.

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