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Studies on molluscan diversity of Sina dam from Ahilyanagar district of Maharashtra in relation to fish culture

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ABSTRACT

An ecosystem's health is determined by the qualitative and variety of freshwater mollusc species, which constitute an essential biotic component. The current study on the variety of freshwater molluscs was carried out during June 2023 to May 2024at three distinct stations of Sina dam, Ahilyanagar, Maharashtra. The potential for aquatic molluscs in the area is very high. The current study was conducted to look into the variety, distribution, and significance of Sina dam freshwater *Malacofauna*.Species of freshwater molluscs, representing two different orders and four different families, were identified from our study sites. Photographs and dead Mollusc shell samples that were gathered from in Sina dam serve as the primary sources. The spatial distribution of freshwater mollusc diversity across three distinct stations within our research region is the primary focus of the current study. In the future, more thorough research on the ecology and distribution of freshwater molluscs would be conducted.

Figure : 01 References : 37 Table : 01
KEY WORDS : Fish culture, Molluscan diversity, Pollution, Sina dam.

Introduction

Freshwater molluscs play a significant role in fish rearing practices and are vital to aquatic environments. There are benefits and drawbacks to agribusiness management because of their ecological linkages and diversity. Mollusca is the second biggest phylum of invertebrates after arthropods. They inhabit terrestrial, freshwater, and marine environments.They originated in the sea, but they now inhabit freshwater and land, where their species diversity is nearly equal. There are currently 5,249 Mollusca species in India,More recent work[8] indicates higher numbers which constitutes around 6.14% of the total global molluscan diversity. There was recorded 5100 species of comprising both,freshwater (22 families, 53 genera, and 183 species) and terrestrial (26 families, 140 genera, and 1487 species) species[30]. The diversity of freshwater molluscs has been the subject of countless investigations by Indian specialists. There are about 200 species of freshwater molluscs from India that belong to the Gastropod and Bivalve classes[22]. There were 208 freshwater mollusc species[35] in 2014. Of the 5000 species of freshwater molluscs known to exist worldwide are found in India. In May 2017 updated study on the

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TABLE-1 : Occurrence of different species of Molluscs in Sina dam during June 2023 to May 2024.

Phylum	Class	Order	Family	Species
Mollusca	Gastropoda	Architaenioglossa	Viviparidae	*A. Bellamya bengalensis* *B. B.eburnea* *C. Idiopoma dissmilis*
			Thiaridae	A. Tarebia granifera
			Melonidae	*A. Melanoides tuberculata*
	Bivalvia	Unionida	Unionidae	*B. Lamellidens corrianus* C. L.*marginalis*

issue found that 150 of these belong to the class Gastropods and 67 to the class Bivalves[17]. One of the world's hotspots for biodiversity, the Western Ghat is home to a large number of freshwater molluscs. 52 gastropods and 25 bivalves are among the 77 species of freshwater molluscs that have been identified from the Western Ghat alone[5]. However, the fauna of molluscs in Maharashtra has not been adequately investigated, and the knowledge that is currently available on freshwater molluscs is dispersed. Before independence, a few workers[3,4,16,], made contributions related to Freshwater Molluscs fauna distribution. After independence various researchers[12,17,23,27,28,30,33,34] have made contribution. But most of the studies were concentrated on distributional aspect and none of the authors studied ecologically. The main objective of the present study is to document and analyses the species richness of freshwater Mollusc diversity of three different stations of Sina dam from Ahilyanagar district of Maharashtra. This research work is completely focused on distribution of freshwater mollusc in our research areas. Further extensive research work related to ecological aspect of freshwater mollusc will be carried out in future.

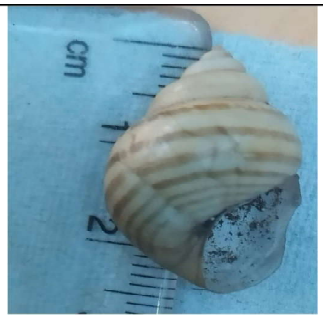
Material and Methods

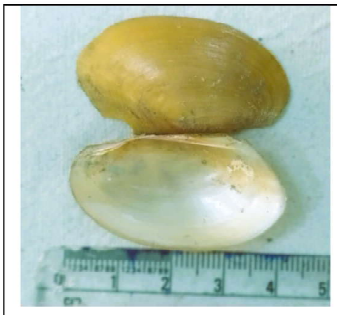
Study Area: Sina dam, selected as a freshwater body for the present investigation is a man-made perennial lake located in Nimgaon Gangarde Village, Taluka Karjat, Ahilyanagar district (Maharashtra), India. This Lake was built over a tiny river, one of Sina' tributaries. This lake is with full of water during rainy and winter season, however, water level decreases during summer. This lake is a significant source of water to nearby villages for drinking, agriculture and fishing practices. The height of the dam above lowest foundation is 28.5 m (94 ft) while the length is 1,580 m (5,180 ft). The volume content is 681.5 km^3 (163.5 cu mi) and gross storage capacity is 67,950.00 km^3 (16,302.07 cu mi).

At specified sites, mollusca species were collected from June 2023 to May 2024. The samples were taken once per month over a yearly period. Following sample collection, specimens were cleaned and preserved in 4% formalin, molluscan shells were dried and kept in a polythene bag in the laboratory. The specimens were identified using standard keys provided[3,4].

Results and Discussion

In the present investigation molluscan diversity (Table-1 & Fig.1) of Sina dam were done during the period June 2023 to May 2024. Total seven species of Freshwater molluscs were recorded and identified from three different sampling sites of S1,S2 and S3 of Sina dam, which belong to 2 different Order and 4 different families. Mollusc's records include 5 Species of Class - Gastropoda and 2 Species of Class - Bivalvia. They[3,4] were *Bellamya bengalensis*, *B.eburnea*, *Idiopoma dissmilis*, *Melanoides tuberculata*,*Tarebia granifera* belong to class Gastropoda, The relationship between the freshwater gastropod and fish is primarily as a prey-source within the aquatic food web. While snails like gastropod are a food source for fish, the snail also plays a crucial role in maintaining water quality and nutrient balance in its ecosystem. *Lamellidens corrianus* and *L.*

			
B.bengalensis (D.V)	*B.bengalensis* (V.V)	*B.eburnea* (D.V)	*B.eburnea*(V.V)
			
Idiopomadissmilis(D.V)	*Idiopomadissmilis*(V.V)	Tarebia granifera	*Melanoides tuberculata*

	
Lamellidens.marginalis	*Lamellidenscorrianus*

(D.V =Dorsal View), (V,V=Ventral View)

Fig. 1 : Fresh water molluscan diversity of Sina dam Ahilyanagar (MS), India

marginalis belonging to class Bivalvia were recorded during study time period.Fishery linkages and interactions with the environment in which bivalves serve as sources of food patterns, biological indicators, and where trash could be processed and water quality enhanced by integrating bivalves with fish husbandry the two families of freshwater gastropods that have been identified in the Sina dam research region are Viviparidae and Thiaridae. Of Class – Bivalvia which is also belonging to family Unionidae were recorded from Sina dam. Apart from Gastropods shells, Bivalve shell was also recorded from sampling site. *M.tuberculata* and *T.granifera* are the intermediate host parasite fish, the negative impact of fish population[7]. Freshwater molluscs fauna are important biotic component of freshwater ecosystems and it is also representing the health of given aquatic ecosystem. Workers[23] reviewed land and freshwater molluscs of Maharashtra state and listed 72 species and varieties of freshwater molluscs. In this study 7 Species of Freshwater molluscs which belong to 2 different order and 4 different families were recorded and identified. But there is lack of literature about Freshwater molluscs of Sina dam. The present research work is only focus on distribution of freshwater mollusc's diversity in a research area.

Conclusion

It is clear from the afore mentioned data that freshwater molluscs are important macrobenthic creature. The taxa of Molluscs are abundant and rich. All collection sites had species that are typically plentiful in Sina Dam. To detect contamination in the Sina dam, mollusca bio- indicators would be employed.

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