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Study Of Mollusca Diversity In Masanjore Dam, Dumka, Jharkhand

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Abstract:-

Masanjore Dam is a big freshwater dam located in the dumka district of the Santhal pargana division belonging to Jharkhand State. This dam is built on the Mayurakshi river and serves as a boon for the santhal pargana region of Jharkhand state and some parts of West Bengal state. In this dam, we conducted a study of freshwater mollusks during the three season (Pre-monsoon, Monsoon, Post-Monsoon) of 2024-2025 . In every season we collected a molluscs from two sites :- Jibanpur village area and Jhajhapara village area. We collected a total of 7 species belonging to 2 classes:- Gastropoda and Bivalvia ,5 families and 6 genera. Among them, *Filopaludina bengalensis* was found in highest numbers in all the season while *Lymnaea accuminata* was obtained in the lowest numbers.

Keywords:- Mollusks, Genera, Season, Freshwater, Masanjore Dam, Santhal Pargana

Introduction

After insects, mollusca are the most successful group of invertebrates and contribute the second largest amount of biodiversity in the planet. [1] [2] About 2300 (or 65%) of the approximately 3600 species in the 279 out of 586 families that have been identified in the Indian subcontinent are marine while the remaining species are freshwater . [3] From the deepest ocean trenches to the intertidal zones, they can be found in freshwater environment such as rivers , lakes, swamp, springs, streams, temporary ponds, subterranean aquifers, seasonal water and drainage ditches including terrestorial ecosystem. [4] Mollusca play a crucial role in the flow of energy across food webs. These organisms are large enough to be held by a mesh size of 200-500 um, and they typically spend at least a portion of their life cycle on bottom substrates.[5] Two classes of mollusks ,Gastropoda (meaning “stomach foot”) and Bivalvia (meaning “two valves”or “shells”) are well represented in freshwater environments. [6] Freshwater mollusks provide a source of protein in several nations, including the Philippines, Thailand. Taiwan [7] Mexico [8] and India [9] . Every freshwater mollusks has one or two shells with a robust inner layer of mainly crystalline calcium carbonate and a thin outer layer of proteinaceous perisostacum. Additionally , freshwater mollusks are important for veterinary and public health and require further research. A vital role in the aquatic ecosystem is played by some edible freshwater mollusks .They also give fish, birds, animals and even human beings a vital source of nourishment . By recycling nutrients

and living as food for certain aquatic animals, molluscs serve as biological and environmental indicators and are essential to the upkeep of aquatic ecosystem. Mollusks have evolved a variety of intricate biological mineralization processes. [10]

Located in the Indian state of Jharkhand, close to Dumka, Masanjore Dam is a Hydroelectric dam that spans the Mayurakshi river. Across the Mayurakshi, the Masanjore dam (also known as the Canada dam) was put into service in 1955. Canadian Foreign minister Lester B. Pearson publically launched it. The catchment area of the Mayurakshi river at the dam location is 1869 km². The Masanjore dam, located at 23°06'03"N and 87°19'31"E, is roughly 34 kilometers (21 miles) from Dumka in Jharkhand and 36 kilometers (22 miles) upstream from Siuri in West Bengal. It measures 661.58 meters long and 47.25 meters high from the ground. When full, the reservoir area is 67.4 square kilometers (16,650 acres), and it can hold 617,000,000 cubic meters (500,210 acre ft).

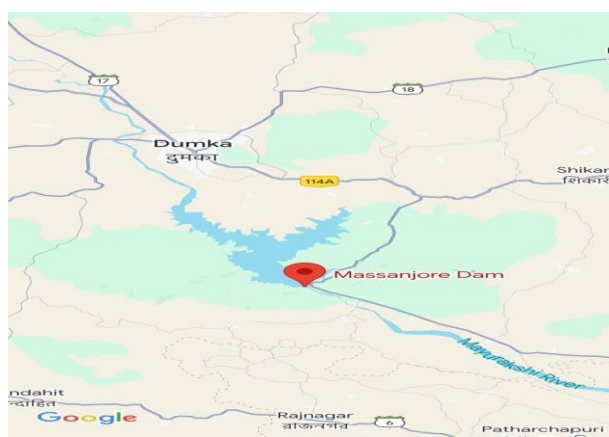


Fig.1:- Map of Masanjore Dam



Fig.2:- View of Masanjore Dam Area

Materials and Methods

Study Area

We choose two sites for sample collection at the Masanjore dam. The first site was the village area of Jhajhapara and the second site was the village area of Jibanpur. The distance between Jhajhapara village area and Jibanpur village area is 15 km.

Site 1 :- Jhajhapara village Area:- Clay makes up the whole soil in the Dam basin at this location along with significant organic matter deposition. Water lilies frequently cover the entire surface area of this location due to their rapid growth and because of its deeper depth the area is less affected by people or animals, but the water stays pure during the rainy season.

Site 2:- Jibanpur village area :- The site's basin is formed of decomposing litters and fine clay. Water lilies often appear in the late monsoon and persist until the end of winter. Singhara, a floating crop plant is also growing moderately during this time. Maximum human and domestic cattle intrusion for a variety of purpose is a defining feature of this site.



Fig.3:- Site 1:- Jhajhapara village area



Fig.4:-Site 2:- Jibanpur village area

Collection Preservation and Identification



Fig.5:- Collection and preservation of Mollusca

We conducted sample collection from february 2024 to January 2025. The sample collection was done season wise:- Pre-monsoon , Monsoon and Post-monsoon . we collected sample at a depth of up to 2.5 ft in the littoral zone . The samples were collected using a net and handpicked. After that, the samples were washed in tap water and then preserved in 70% ethanol. Subsequently , we identified the mollusks by observing their external and internal shell characteristics. In addition to other accessible literature, Species were identified using Ramakrishna and Dey (2007), Subha Rao (1989) and Budha (2016a and 2016b). By calculating the total number of species, diversity was calculated. Data from Molluscan diversity indices were computed using the PAST software.

Result and Discussion

During the study of the three seasons, we obtained a total of 7 species belonging to the class Gastropoda and the class Bivalvia . Among them , 5 species belong to the class Gastropoda and 2 species belong to the class Bivalvia .We identified 7 species across 7 genera , which belong to 5 families . The highest numbers of species was found in the family Viviparidae, while the lowest number of species was found in the family Lymnaeidae, In the study across all three seasons, *Filopaludina bengalensis* was found in the highest quantity while *Lymnaea accuminata* was found in the lowest quantity. In the present study, *Filopaludina bengalensis* was

most dominant followed by *Pila globosa*, *Gyraulus ladacensis*, *Lamellidens corrianus*, *Indoplanorbis exustus*, *Lamellidens marginalis* and *Lymnaea accuminata*. Among Bivalvia dominant species was *Lamellidens corrianus* and among class Gastropoda *Filopaludina bengalensis* was the dominant species followed by *Pila globosa* was second largest dominant species in class gastropoda and in Bivalvia second largest dominant species is the *Lamellidens marginalis* during the present observation study. The maximum diversity of molluscan was found in post-monsoon and minimum diversity was found in monsoon. In monsoon season it becomes challenging to gather them since the species at the bottom of the water and the water fills up to the dam's edge. Many organisms spawn during the monsoon leading to the emergence of numerous new organism and the water becomes pollution free after the monsoon. That's why many organism can be found in post-monsoon. (Bijukumar et.al., 2001) Studied The Molluscan community of the Bharathapuzha river in kerela was the subject of a similar study, which identified thirteen species of molluscs from five orders, eight families and ten genera. (Durga Prasad et.al., 2001) Collected 48 species of molluscs from the Gasthani estuary, including 21 pelecypods and 27 gastropods. (Suryawanshi et.al., 2012) Investigated biodiversity of molluscs from river Godavari reservoir and pond, reported 24 species of freshwater molluscs. The Godavari river yielded the fewest species while the Derla Tank yielded the most. (Farida et.al., 1988) 59 species were found in the Layari river. Of these, 31 species are classified as gastropods, 27 as Bivalvia, and these is just one species in the class scaphopoda. The rich productivity is indicated by the abundance of molluscan fauna.

Table 1:- Number of Molluscan Species of Masanjore Dam observed during Febuary 2024 to January 2025.

Class	Family	Species	Pre-Monsoon		Monsoon		Post-Monsoon	
			Site 1	Site 2	Site 1	Site 2	Site 1	Site 2
Gastropoda	Viviparidae	<i>Filopaludina bengalensis</i>	13	7	9	7	21	17
	Pilidae	<i>Pila globosa</i>	6	0	5	2	11	4
	Lymnaeidae	<i>Lymnaea accuminata</i>	0	2	1	0	2	4
	Planorbidae	<i>Gyraulus ladacensis</i>	3	5	0	0	7	9
		<i>Indoplanorbis exustus</i>	2	4	1	2	3	2
Bivalvia	Unionidae	<i>Lamellidens corrianus</i>	3	6	2	2	7	4
		<i>Lamellidens marginalis</i>	0	2	1	2	2	3

Table 2:-Diversity index of Molluscan diversity in different season during the period of study

Diversity indices	Pre-Monsoon						Monsoon						Post-Monsoon					
	Site 1	Lower	Upper	Site 2	Lower	Upper	Site 1	Lower	Upper	Site 2	Lower	Upper	Site 1	Lower	Upper	Site 2	Lower	Upper
Taxa_S	5	4	5	6	6	6	6	3	6	5	4	5	7	7	7	7	6	7
Individuals	27	27	27	26	26	26	19	19	19	15	15	15	53	53	53	43	43	43
Dominance_D	0.311	0.237	0.49	0.198	0.181	0.2929	0.313	0.219	0.518	0.289	0.218	0.564	0.241	0.194	0.339	0.2331	0.182	0.3467
Simpson_1-D	0.689	0.51	0.763	0.802	0.707	0.8195	0.687	0.477	0.7812	0.711	0.436	0.782	0.759	0.6614	0.806	0.7669	0.653	0.8177
Shannon_H	1.367	0.968	1.519	1.691	1.439	1.746	1.407	0.839	1.636	1.43	0.857	1.564	1.638	1.395	1.768	1.685	1.386	1.813
Margalef	1.214	0.91	1.214	1.535	1.535	1.535	1.698	0.679	1.698	1.477	1.108	1.477	1.511	1.511	1.511	1.595	1.329	1.595

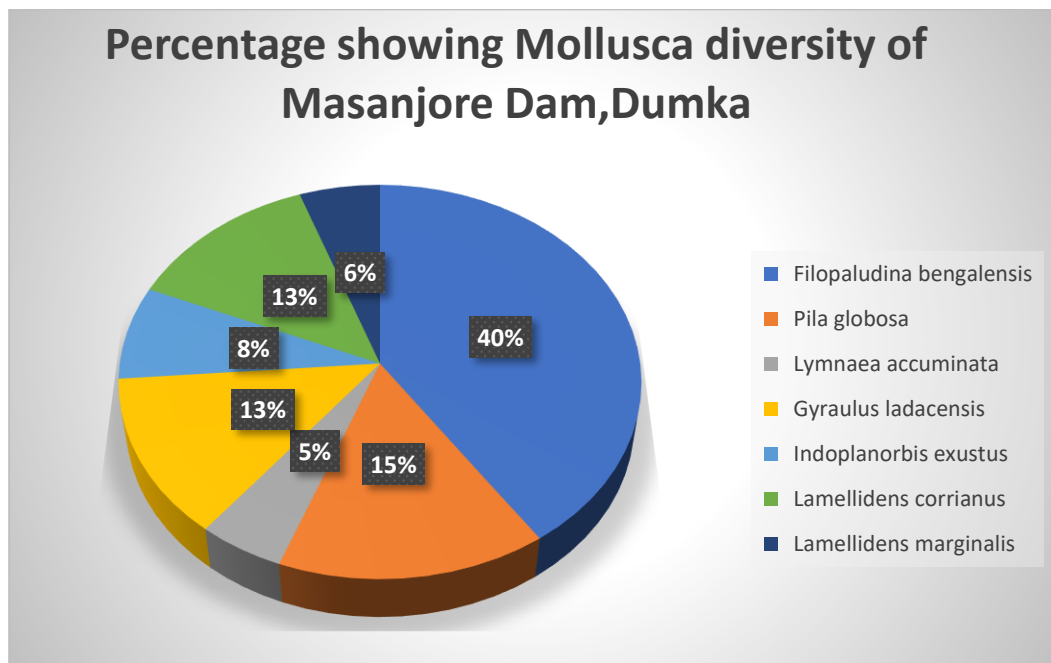


Fig.6:- Identified species from Masanjore Dam



*Lymnaea accuminata**Gyraulus ladacensis**Indoplanorbis exustus*

Conclusion

The current work, which is a grassroots surveys of the variety of freshwater macrofauna species, is undoubtedly expanding our understanding and providing a baseline for further research. The ecological health of the water bodies is evaluated using freshwater molluscs. The study's significant findings which showed that gastropoda were more prevalent than Bivalvia, were taken out. The result of this study may help improve the management and preservation of the local molluscan fauna.

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