DIVERSITY OF MOLLUSCAN FAUNA IN POPATKHED DAM FROM AKOLA DISTRICT OF MAHARASHTRA (INDIA)

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Abstract
The present study was conducted to assess the diversity of molluscan fauna from Popatkhed dam, Akola district of Maharashtra (India). Molluscs play a crucial role in aquatic ecosystems as bioindicators of water quality, contributing to nutrient cycling and serving as a food source for other organisms. The findings of the study provide insights into the species composition, abundance, and their correlation with various environmental parameters. During study, about 32 species were recorded. Out of these those species, 09 species belonging to the 2 families of class Bivalvia while 23 species belonging to the 11 families of class Gastropoda were observed. The gastropods were more dominant than bivalves, a pattern commonly observed in other freshwater ecosystems. Overall, this study provides baseline data on molluscan diversity in Popatkhed Dam and contributes to the broader understanding of freshwater ecosystem health. The research underscores the importance of integrating biodiversity assessments with water quality monitoring for effective conservation and management of freshwater resources.
Keywords: *Bivalvia, Diversity, Gastropoda, Mollusca, Popatkhed.*

Introduction

Molluscs are particularly important in aquatic ecosystems, where they contribute to habitat formation, sediment stabilization, and biodiversity enhancement. Various species of bivalves, such as clams, oysters, and mussels, act as natural engineers, altering and improving their environments in ways that benefit numerous other organisms (Grabowski *et al.,* 2012). Molluscs also play a fundamental role in sustaining food webs, serving as a primary food source for a vast array of organisms, ranging from small invertebrates to top predators. Birds, fish, reptiles, and mammals all depend on molluscs for sustenance, with many species having evolved specialized feeding behaviours and anatomical adaptations to efficiently consume them (Clarke, 1996).

Molluscs play a crucial ecological role in maintaining biodiversity, supporting food webs, and contributing to ecosystem stability. However, their populations are increasingly threatened by a range of human-induced environmental changes, including habitat degradation, overexploitation, pollution, ocean acidification, and climate change. These threats jeopardize not only molluscs themselves but also the ecosystems they support and the human livelihoods that depend on them. Without immediate conservation efforts, the loss of molluscs could have cascading effects on biodiversity and ecosystem function (Wagh *et al.*, 2019),

One of the most significant stressors on both freshwater and marine ecosystems is habitat degradation. Activities such as water pollution, dam construction, excessive water extraction, and the introduction of non-native species have led to severe disruptions in aquatic environments. The introduction of exotic species has particularly impacted aquatic ecosystems, with certain fish species causing imbalances when introduced into foreign habitats. Additionally, increasing pollution, resulting from human activities like the discharge of household and industrial waste and the overuse of chemical fertilizers and pesticides, has further deteriorated both surface and groundwater quality (Orr *et al.,* 2005).

Hence the present study was conducted to assess the diversity of molluscan fauna from Popatkhed dam, Akola district of Maharashtra (India).

Materials And Methods

An investigation was conducted during February 2022 to January 2024 to study the diversity of molluscan fauna at Popatkhed dam from Akola district of Maharashtra (India). An effective protocol was adopted. Popatkhed Dam is an earthen type of reservoir that is located between 21.20°N 77.08°E. It is an earthfill dam on river near Akot, Akola district in the state of Maharashtra in India.

The climate of this district is characterized by a hot summer, well-distributed rainfall during the south-west monsoon season and generally dry weather during the rest of the year. The cold season is from December to February. This is followed by the hot season from March to May. The southwest monsoon season is from June to September while October and November constitute the post-monsoon season (Falling Rain Genomics 2022-2024).

The survey was performed at a weekly interval in all collection sites. Specimens were collected by hand picking method from selected sites during the

study period. Collected Molluscan washed properly and preserved in 5% formalin first and then transferred in 70 % alcohol. Photographs of the specimens were taken by Nikon camera D7000 and lens 60 mm micro for documentation and identification purpose. The specimens are identified as per Subba Rao (1989) and other available literature.

Table 1. Checklist of Molluscan species found in Popatkhed Dam

Sr.no	Class	Family	*Species*
1.	Bivalvia	Cyrenidae	*Corbicula peninsularis (Prashad, 1928)*
2.	Bivalvia	Cyrenidae	*Corbicula striatella (Deshayes, 1854)*
3.	Bivalvia	Unionidae	*Lamellidens consobrinus (Lea, 1856)*
4.	Bivalvia	Unionidae	*Lamellidens corrianus (Lea, 1819)*
5.	Bivalvia	Unionidae	*Lamellidens marginalis (Lamarck, 1819)*
6.	Bivalvia	Unionidae	*Parreysia caerulea (Lea, 1856)*
7.	Bivalvia	Unionidae	*Parreysia corrugata (Müller, 1774)*
8.	Bivalvia	Unionidae	*Parreysia cylindrica (Annandale and Prashad, 1919)*
9.	Bivalvia	Unionidae	*Parreysia favidens (Benson, 1862)*
10.	Gastropoda	Achatinidae	*Achatina fulica (Bowdich, 1822)*
11.	Gastropoda	Ampullariidae	*Pila globosa (Swainson, 1822)*
12.	Gastropoda	Ampullariidae	*Pila virens (Lamarck, 1822)*
13.	Gastropoda	Ariophantidae	*Cryptozona semirugata (Beck, 1837)*
14.	Gastropoda	Ariophantidae	*Macrochlamys indica (Benson, 1832)*
15.	Gastropoda	Bithyniidae	*Gabbia orcula (Frauenfeld, 1862)*
16.	Gastropoda	Cerastidae	*Rachis punctatus (Anton, 1838)*
17.	Gastropoda	Lymnaeidae	*Lymnaea acuminata (Lamarck, 1822)*
18.	Gastropoda	Lymnaeidae	*Lymnaea luteola (Lamarck, 1822)*
19.	Gastropoda	Paludomidae	*Paludomus obesus (Philippi, 1847)*
20.	Gastropoda	Planorbidae	*Gyraulus convexiusculus (Hutton, 1849)*
21.	Gastropoda	Planorbidae	*Gyraulus labiatus (Benson, 1850)*
22.	Gastropoda	Planorbidae	*Gyraulus rotula (Benson, 1850)*
23.	Gastropoda	Planorbidae	*Indoplanorbis exustus (Deshayes, 1834)*
24.	Gastropoda	Thiaridae	*Thiara lineata (Gray,*
25.	Gastropoda	Thiaridae	*Thiara scabra (Müller, 1774)*
26.	Gastropoda	Thiaridae	*Thiara tuberculata (Müller, 1774)*
27.	Gastropoda	Veronicellidae	*Laevicaulis alte (Férussac, 1821)*
28.	Gastropoda	Veronicellidae	*Semperula maculata (Templeton, 1858)*
29.	Gastropoda	Viviparidae	*Bellamya bengalensis (Lamarck, 1822)*
30.	Gastropoda	Viviparidae	*Bellamya doliaris (Gloud, 1844)*
31.	Gastropoda	Viviparidae	*Bellamya dissimilis (Müller, 1774)*
32.	Gastropoda	Viviparidae	*Bellamya eburnea (Annandale, 1921)*

Corbicula peninsularis

Corbicula striatella

Achatina fulica

Pila globosa

Lamellidens consobrinus

Lamellidens corrianus

Pila virens

Cryptozona semirugata

Lamellidens marginalis

Parreysia caerulea

Macrochlamys indica

Gabbia orcula

Parreysia corrugata

Parreysia cylindrica

Rachis punctatus

Lymnaea acuminata

Parreysia favidens (Benson, 1862)

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Lymnaea luteola

Paludomus obesus

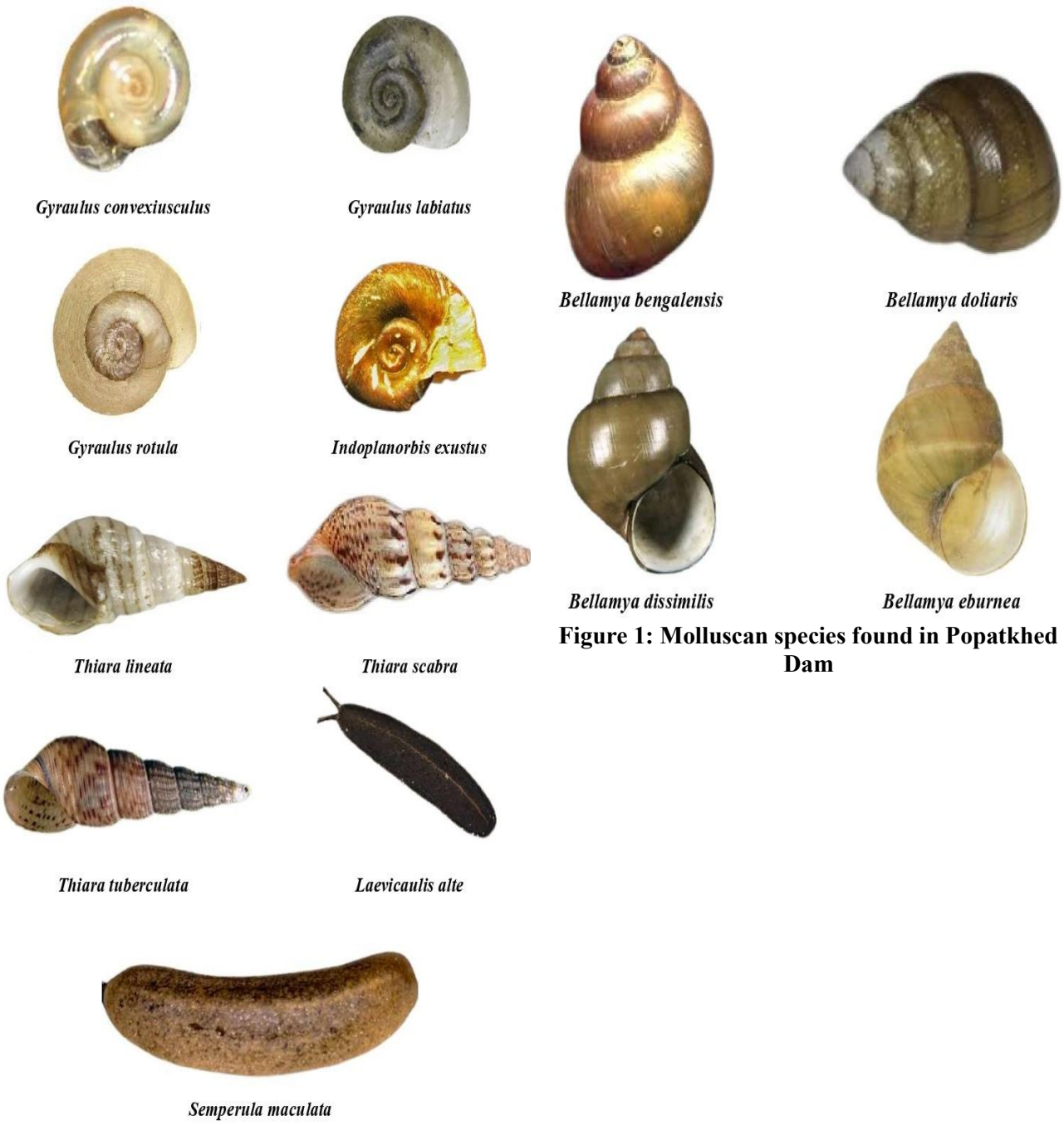

Figure 1: Molluscan species found in Popatkhed Dam

Results and Discussion

The Popatkhed Dam exhibits a rich diversity of molluscan species. Biodiversity, Molluscs play a significant role in aquatic biodiversity, with representatives from both the Gastropoda and Bivalvia classes. During study 09 species belonging to the 2 families of class Bivalvia while 23 species belonging to the 11 families of class Gastropoda were observed. The gastropods were more dominant than bivalves, a pattern commonly observed in other freshwater ecosystems (Rosenberg and Langer, 2008). Frequently encountered species, such as *Bellamya bengalensis, Indoplanorbis exustus, Pila globosa,* and *Lymnaea luteola*, demonstrate their adaptability to prevailing environmental conditions. The presence of bivalves like *Lamellidens marginalis* suggests relatively stable water conditions with moderate organic load, as these filter feeders are highly sensitive to pollution (Cummings and Graf, 2010).

The seasonal occurrence of freshwater molluscs in Maharashtra is influenced by monsoon patterns, water availability, and temperature fluctuations. During the monsoon season (June to September), mollusc populations thrive due to increased water levels, nutrient availability, and favorable breeding conditions in rivers, lakes, and reservoirs. Species such as *Bellamya bengalensis*, *Pila globosa* and *Lamellidens marginalis* are commonly found in these water bodies. Post-monsoon (October to

February), their populations remain stable, benefiting from residual water levels and cooler temperatures. However, during the dry summer months (March to May), many freshwater bodies shrink, leading to a decline in mollusc populations. Some species burrow into the substrate or enter aestivation to survive unfavourable conditions. Human activities, pollution, and habitat alterations further impact their seasonal distribution in Maharashtra's freshwater ecosystems.

The observed species composition was found to be in well agreement with many of previous studies that mainly deals with molluscan diversity of lake ecosystem. These recent studies mainly included Aravind *et al.* (2011), Upadhye *et al.* (2011), Waghmare *et al.* (2012), Sharma et al. (2013), Karthick *et al.* (2014), Chavan and Pawar (2015), Sarwade *et al.* (2015), Jadhav and Patil (2016), Shinde *et al.* (2016), Kadam et al. (2017), Padghane *et al.* (2017), Patel *et al.* (2017), Bhuban et al. (2018), Singh and Mishra. (2019), Wagh *et al.* (2019), Parikh *et al.* (2020), Rehanuma *et al.* (2020), Chutia *et al.* (2021), Ahire *et al.* (2022), Premalatha *et al.* (2022), Dahegaonkar *et al.* (2023), Sonule *et al.* (2023), Dwivedi *et al.* (2024), Priyadarsini (2024), Chhandaprajnadarsini *et al.,* (2025) and name a few.

Conclusion

The study highlights the vital role of molluscs in aquatic ecosystems as bioindicators, nutrient cyclers, and a food source. It examines species composition, abundance, and environmental correlations in Popatkhed Dam, identifying 09 bivalve species from 2 families and 23 gastropod species from 11 families, with gastropods being more dominant. The findings provide baseline data on molluscan diversity and emphasize the need to integrate biodiversity assessments with water quality monitoring for effective freshwater conservation and management.

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