

DOI No.: <http://doi.org/10.53550/EEC.2024.v30i01s.014>

Comparative Study of Molluscan Diversity of Kelve and Shirgaon Beach, Palghar, Maharashtra (India)

George J.¹, Vazurkar N.², Gite V.A.², Jadhav T.S.² and Dhangada P.²

^{1,2}*Department of Zoology M.H. Mehta College of Science, Palghar 401 404, M.S., India*

(Received 5 June, 2023; Accepted 8 August, 2023)

ABSTRACT

Coastal ecosystems, encompassing various habitats such as mangroves, coral reefs, beaches, cliffs, lagoons, and estuaries, are vital for the diversity of life. Mollusks, belonging to the phylum Mollusca in the animal kingdom, play a significant role in coastal ecosystems. They serve as important members of the food chain and exhibit remarkable ecological adaptations to various habitats. This research aims to investigate the diversity of mollusks at Kelwa and Shirgaon beaches in Palghar district, Maharashtra. The study will reveal the molluscan diversity at these specific locations, providing insights into their biological classification through systematic arrangement and accompanying shell photographs.

Key words: Mollusca, Biological diversity, Kelwa beach, Shirgaon beach, Palghar

Introduction

India is recognized as one of the world's 12 mega-biodiverse countries, hosting 25 hotspots that represent highly endangered eco-regions. Coastal and marine biodiversity in India has been extensively studied for over two centuries, distinguishing it from other Asian countries. Mollusks, a diverse phylum of invertebrates, hold great significance in the food chain and provide resources for coastal populations (Anuradha David *et al.*, 2013).

Mollusks are not only diverse and abundant but also have economic and medicinal value (Anuradha David, 2013). Throughout history, they have served humans as a source of food, jewelry, tools, and even pets. In India, marine mollusks are found in various habitats, including mangroves, coral reefs, rocky coasts, sandy beaches, sea grass beds, and deeper oceanic regions. The recorded marine mollusk species in India range from 80,000 to 100,000, with 3,370 species identified in marine habitats (Ashokkumar

Vaghela *et al.*, 2013). Several mollusk species, such as oysters, mussels, clams, and cephalopods, are exploited for nutritional and economic purposes (Venkataraman and Venkataraman, 2004).

The global decline of molluscan fauna, along with other marine organisms, due to human interference, raises concerns about biodiversity loss. Such loss impacts ecosystem functioning and the provision of ecological services. Therefore, understanding the diversity and conservation status of molluscan fauna is crucial.

This study focuses on investigating the molluscan diversity at Kelwa and Shirgaon beaches in Palghar District, Maharashtra, which have not been previously studied. These sandy shores and their intertidal zones harbor a wide range of molluscan diversity. By identifying and documenting the mollusk species, this research will contribute to the understanding and conservation of Molluscan diversity in these specific coastal areas.

(¹Assistant Prof., ²Student)

Study Area

The study was conducted in Palghar taluka of Palghar district, Maharashtra, in the Konkan division. Two beaches were selected for the study:

Kelwa Beach (Latitude 19.6109° N and Longitude 72.7300° E): This sandy shore with its intertidal zone exhibits significant molluscan diversity. No previous research has been conducted in this area.

Shirgaon Beach: Located in Palghar district, Maharashtra, Shirgaon Beach (Latitude 19.6778° N and Longitude 72.8063° E) also represents a promis-

ing location to study molluscan diversity. This area has not been previously investigated for its mollusk fauna.

The study area was visited fortnightly during low tide in the mornings, from 13th February 2022 to 13th February 2023 for Kelwa Beach, and from 12th February 2022 to 12th February 2023 for Shirgaon Beach.

Sampling Procedure

Molluscan specimens were collected from sandy beaches and intertidal zones at both Kelwa and

Table 1. Molluscan Species Identified at Kelwa Beach

Sr. No.	Class	Subclass	Order	Family	Genus Species
1.	Bivalvia	Autobranchia	Cardiida	Tellinidae	Angulus sinuata Melvill and Ambercrombi
2.	Bivalvia	Autobranchia	Veneroida	Cardiidae	Cardium setosum (Redfern)
3.	Gastropoda	Caenogastropoda	Caenogastropoda	Cerithiidae	Cerithium morus (Lamarck)
				Potamididae	Potamides cingulatus (Gmelin)
4.	Gastropoda	Caenogastropoda	Littorinimorpha	Bursidae	Bursa tuberculata (Brodrip) TUBER-CULATED FROG
5.	Gastropoda	Caenogastropoda	Neogastropoda	Mitridae	Mitra cucumerina (Lamarck) Mitra stictica (Link) PONTIFICAL MITRE
			Muricidae	Drupa konkanensis (Blainville) Thais carinifera (Lamarck) Thais tissoti (Petit)	
			Nassariidae	Cyllene fuscata (A. Adams) assa ornatus (Kiener)	
			Olividae	Oliva caerulea (Röding) Oliva nebulosa intricata (Marret)	
		Pisaniidae	Cantharus spiralis (Gray)		
6.	Gastropoda	Heterobranchia	Ellobiida	Ellobiidae	Cassidula nucleus (Gmelin)
7.	Gastropoda	Neritimorpha	Cycloneritida	Neritidae	Nerita albicilla (Linne) OX-PLATE NERITE Nerita costata (Gmelin) COSTATE NERITE Nerita oryzarum (Recluz) Euchelus tricarnata (Lamarck)
8.	Gastropoda	Vetigastropoda	Archaeogastropoda	Trochidae	Euchelus asper (Gmelin)
9.	Gastropoda	Vetigastropoda	Seguenziida	Chilodontaidae	Clanculus ceylanicus (Nevill)
10.	Gastropoda	Vetigastropoda	Trochida	Trochidae	Umbonium vestiarium (Linne) BUTTON SHELLS Astraea semicostata (Kiener)

Shirgaon beaches. The following procedure was followed:

Mollusca shells were collected by handpicking using gloves to avoid damage or alteration of shell color.

Collected shells were washed with water to remove sand and mud.

Once cleaned, the shells were dried and kept in separate plastic zip pouches for identification and further analysis.

Morphological characters and special features were observed for the identification of molluscan specimens. Standard literature and available identification keys for molluscs were referred to during the identification process.

The identification of molluscan shell species was further validated using references from other research papers, "The Book of Indian Shells" by Deepak Apte, and the World Register of Marine Species website for detailed taxonomic study.

Results and Discussion

The collected molluscan specimens from both Kelwa and Shirgaon beaches were identified using various references. The identified species along with their classification are presented in the table below:.

The identified molluscan species from both beaches were found to belong to various classes, subclasses, orders, families, and genera. This indicates a diverse range of molluscan fauna present at Kelwa and Shirgaon beaches. The presence of unique species in each location suggests the influence of specific ecological factors and habitats.

Comparative analysis of molluscan diversity between Kelwa and Shirgaon beaches revealed some similarities and differences. Both locations exhibited the presence of common species such as *Cardium setosum*, *Potamides cingulatus*, *Bursa tuberculata*, *Cassidula nucleus*, *Nerita albicilla*, *Euchelus tricarnata*, and *Astraea semicostata*. However, each beach also showcased distinct species specific to that location.

Table 2. Molluscan Species Identified at Shirgaon Beach

Sr. No.	Class	Subclass	Order	Family	Genus Species
1.	Bivalvia	Autobranchia	Cardiida Donacidae	Cardiidae Donax scortum (Linne)	<i>Cardium setosum</i> (Redfern)
2.	Bivalvia	Autobranchia	Veneroida	Veneridae	<i>Dosinia gibba</i> (Adams)
3.	Gastropoda	Caenogastropoda	Caenogastropoda	Potamididae	<i>Potamides cingulatus</i> (Gmelin)
4.	Gastropoda	Caenogastropoda	Littorinimorpha	Bursidae	<i>Bursa tuberculata</i> (Brodrip) TUBERCULA-TED FROG
5.	Gastropoda	Caenogastropoda	Neogastropoda Clavatulidae Conidae	Buccinidae Surcula amicta (Smith) Conus capitaneus (Linne) CAPTAIN CONE Terebridae	<i>Nassaria suturalis</i> (A. Adams)
6.	Gastropoda	Heterobranchia	Ellobiida	Ellobiidae	<i>Terebra dislocata</i> (Born)
7.	Gastropoda	Neritimorpha	Cycloneritida	Neritidae	<i>Cassidula nucleus</i> (Gmelin) <i>Nerita albicilla</i> (Linne) OX-PLATE NERITE <i>Nerita costata</i> (Gmelin) COSTATE NERITE <i>Nerita oryzarum</i> (Recluz)
8.	Gastropoda	Vetigastropoda	Archaeogastropoda	Trochidae	<i>Euchelus tricarnata</i> (Lamarck)
9.	Gastropoda	Vetigastropoda	Seguenziida	Chilodontidae	<i>Euchelus asper</i> (Gmelin)
10.	Gastropoda	Vetigastropoda	Trochida	Trochidae	<i>Astraea semicostata</i> (Kiener) <i>Chlorostoma funebris</i> (A. Adams) <i>Umbonium vestiarius</i> (Linne) BUTTON SHELLS

The findings of this study contribute to the knowledge of molluscan diversity in the Palghar district of Maharashtra, India. It highlights the need for further research and conservation efforts to protect and preserve the unique mollusk fauna in these coastal areas.

Conclusion

The study conducted at Kelwa and Shirgaon beaches in Palghar district, Maharashtra, aimed to investigate the molluscan diversity in these specific locations. Through systematic collection, identification, and analysis of mollusk specimens, a diverse range of molluscan species were identified.

The results revealed the presence of unique species at each beach, indicating the influence of specific ecological factors and habitats. The findings contribute to the understanding of molluscan diversity in the study area and emphasize the importance of further research and conservation efforts.

This research serves as a foundation for future studies on molluscan diversity, ecological adaptations, and conservation strategies in the Palghar district. Understanding and preserving the rich molluscan fauna in these coastal areas are crucial for maintaining the overall biodiversity and functioning of the ecosystems.

Acknowledgements

The authors are grateful to all the support and necessary facilities made available by the affiliating institutions.

Declarations

Conflict of interest: The authors have no conflicts of interest to declare. Both authors have seen and agree with the contents of the manuscript and there is no financial interest to report. We certify that the submission is original work and is not under review at any other publication.

Informed consent: The manuscript in part or in full has not been submitted or published anywhere.

References

- Anandraj, T., Balasubramanian Subba Rao, N.V., Dey, A. and Barua, S.N.V., Murugesan P. and Muthuvelu, S. 2012. Biodiversity of marine molluscs in east coastal area of Thanjavur district, Tamil Nadu, India. *Pharma and Biol. Archives*. 3(1):131-133.
- Anuradha David, 2013. Biodiversity and distribution of marine gastropods (Mollusca) during pre- and post-monsoon seasons along the Goa coastline, India. Doi: 10.6024/jmbai. 55(1) : 1720-03.
- Apte, D. 1992. *The Indian Book of Shells*. BNHS. Oxford University Press.
- Ashokkumar Vaghela, Poonam Bhadja and Rahul Kundu, 2013. Diversity and Distribution of Intertidal Mollusca at Saurashtra coast of Arabian Sea, India. *G.J.B.B.* 2 (2): 154-158 ISSN 2278 – 9103.
- Deepak Apte, 2004. Molluscan Fauna of Point Calimere Wildlife Sanctuary Part1: Gastropoda. *Journal of the Bombay Natural History Society*. 101 (2): 201-210.
- Deepak Apte, Vishal Bhave, Reshma Pitale, Pooja Nagle and Amruta Prasade, 2012. Diversity of Coastal Ecosystems of Maharashtra Part 3: Ecologically Sensitive Coastal Areas of Ratnagiri, Rajapur and Vijaydurga.
- Khade, S.N. and Mane, U.H. 2012. Diversity of Bivalve and Gastropod, Molluscs of some localities from Raigad district, Maharashtra, west coast of India. *Recent Research in Science and Technology*. 4(10): 43-48 ISSN: 2076-5061.
- Sharma, K.K. 2013. Komal Bangotra and Minakshi Saini. Diversity and distribution of Mollusca in relation to the physico-chemical profile of Gho-Manhasan stream, Jammu (J & K) (March 2013).
- Venkataraman, C. and Venkataraman, K. 2004. Diversity of Molluscan Fauna along the Chennai Coast.
- Vanmali, H.S. and Jadhav, R.N. 2015. Assessment of Molluscan Diversity of Dativare Coast of Vaitarna Estuary, Dist- Palghar, Maharashtra (India). *International Journal of Engineering and Science*. 5 (9):01-06.
- World Register of Marine Species <http://www.marinespecies.org/aphia.php?p=taxdetails&id=507566>
- Worldwide Mollusc Species Data Base <http://www.bagniliga.it/WMSD/SearchSpecies.php?freeText=Angulus+sinuata&inputFamily=&inputGenus=&inputSpecies=&inputVariety=&inputAuthor=&B1=Search>