

## **Study of Diversity of Gastropoda in Mangroves at Shirgaon Dist. Palghar, Maharashtra(India)**

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### **Abstract**

Mangroves are one of the biologically diverse ecosystems in the world, rich in organic matter and nutrients and support very large biomass of flora and fauna. With continuing degradation and destruction of mangroves, there is a critical need to understand the biodiversity of the mangrove ecosystems. The present paper deals with the survey of mangrove species diversity, i.e., shirgaon Maharashtra, India. During this study, 4 species of true mangroves representing 3 genera and 3 families, 5 species of mangrove associates belonging to 4 families, 1 Genus, 1 species of mangrove halophytes were recorded from the mangrove ecosystems and 5 species of mollusca representing 3 genera, 3 families of shirgaon (Palghar), Maharashtra.

**Key words:** Mangrove, Mollusca, Diversity, Shirgaon.

### **1.Introduction**

Mangroves are one among the most productive ecosystems on the earth. They serve as custodians of their juvenile stock and form most valuable biomass (Odam, 1971). Covering about 47% of world's mangrove area, containing 85% of world's mangrove species and occurring in a variety of habitats, the mangrove ecosystem plays a vital role in coastal biodiversity. Certain mangrove species help prevent flooding and erosion of unconsolidated coastlines by breaking the force of waves (FAO 1994). Mangroves are suitable homes for epibenthic, infaunal and meiofaunal invertebrates and are able to support communities of phytoplankton's, zooplanktons and fishes due to the unique environment they create (Cañizares and Seronay 2016). Mangroves are also nurseries and feeding sites for some marine species (Rönback, 1999; Long and Giri 2011) and nesting grounds for hundreds of bird species (Nagelkerken et al., 2008; Garcia et al., 2014). Mangrove ecosystem supports a rich species diversity of flora and fauna but it is facing heavy human pressure and natural stresses leading to the devastation of ecosystem and loss of biodiversity for which it is important to take the measures for conservation and management. Mangrove diversity studied well globally (Abantao et al., 2015; Pototan et al., 2017; Asuk et al., 2018).

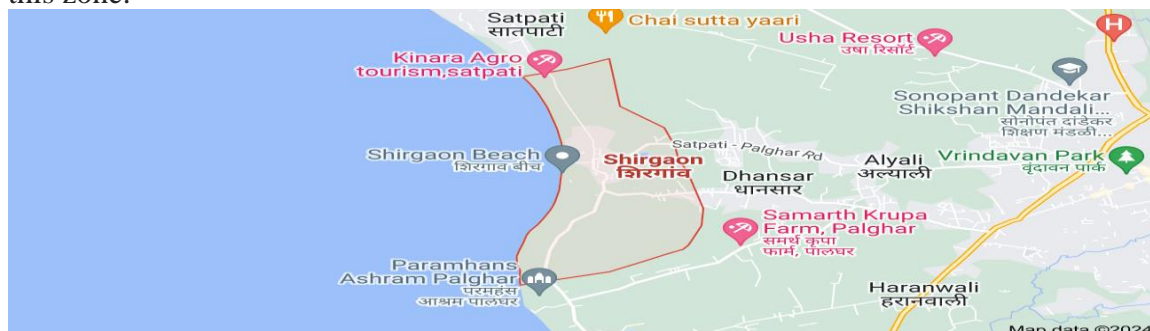
The largest and the most diverse phylum in the tropical seas is mollusca. The molluscs are soft bodied heterogeneous group of animals with great antiquity and diversity. Molluscs are highly successful invertebrates in terms of ecology and adaptation and are found nearly in all habits ranging from deepest ocean trenches to intertidal zones and freshwater to land occupying a wide range of habitats. Much of the molluscan diversity occurs in the tropical world. Despite this great diversity very few studies on mollusks have been carried out in the

tropical world [Emberton K.C. 1991]. Molluscs are extremely important factors of many ecological communities. They prove immensely beneficial both economically and medicinally. They have been important to humans throughout history as a source of food, jewellery, tools and even pets. Molluscs are one of nutritive and ornamental phylum of invertebrate group. Mollusca form a major group which is not only an important link in food chain from primary to tertiary level leading to fish production but an edible source for coastal population. Besides they are used for ornamental trade, pharmacological products and in manufacture of lime and cement [Jaiswar A.K. and Kulkarni B.G. 2005]. In India the marine molluscs are recorded from the diverse habitats. They occur in different habitats such as mangroves, coral reef, rocky coasts, sandy beaches, sea grass beds and also at greater depth in the sea. They are more diverse and abundant in the rocky intertidal zone along the coast, sandy stones, intertidal flats and mangrove areas [Ramkrishna and Dey A. ]. The number of marine molluscs recorded from various parts of the world vary from 80,000 to 1,00,000 species. In India till today 5070 species of molluscs have been recorded of which 3,370 are from marine habitats [Subba Rao, N. V., 1991 ]. 8 species of oysters, 2 species of mussels, 17 species of clams, 6 species of pearl oysters, 4 species of giant clams, 1 species of window pane oysters and other gastropods such as Sacred Chank, Trochus, Turbo as well as 15 species of Cephalopods are exploited from the Indian marine region [Venkataraman, K. and Wafar M, 2005]. An oysters, mussels and clams serve the nutritional needs of the coastal population, they are good source of minerals, protein and glycogen and easily digestible compared to the other animal food [Suryavanshi G.D. et. al.].

In India Sundarban mangrove forest, West Bengal shows the highest taxa diversity reported for the first time from Indian (Mandal et al., 1995). Mangrove ecosystem studied of Indian Ocean region (Kathiresan and Rajendran, 2005). Study on true mangroves, species of mangrove associates belonging Uran region of Alibag district (Pawar, 2011). Further, study on biodiversity of mangroves in estuarine ecosystems of Ratnagiri District, Maharashtra (Naikwade, 2014; Mulla and Chavan, 2017). Study also shows that the occurrence of a threatened species along the coast of Maharashtra (Gokhale et al., 2015). Diversity mangrove species studied on Sunderban biosphere reserve (Brahma and Mukherjee, 2016). Diversity mangrove species studied on Kerala coast (Sreelekshmi et al., 2018). Till now extensive research on ecological aspects of mangrove and mollusca diversity has been carried out in India. However, data on mangrove and mollusca diversity from Palghar district is not available. Hence, the present study on species diversity of mangrove and mollusca ecosystem of Shirgaon is undertaken.

## 2. Study area

Shirgaon beach located in Palghar District of Maharashtra. Shirgaon beach (Latitude 18.0979° N and Longitude 73.6293° E ). This sandy shore with its intertidal zone exhibits significant mangrove and molluscan diversity. No previous research has been conducted in this area. Hence, this area has been chosen to study the diversity of mangrove and molluscs from this zone.



### 3. Materials and methods

The mangrove species photographs were taken at site with mobile camera. The mangrove specimen were collected and sealed in the clean polythene bag and brought to laboratory. They were identified using the mangrove identification manual and standard floras (Shah, 1978; Banerjee, 1089; Kathiresan, 2000; Rajendran, 2004)..The molluscans were collected by hand picking using gloves. The molluscan shells were collected and brought to laboratory in clean polythene bag. The shells were washed with water to remove sand and mud without damaging or altering the color of shells d then dried. Once dried shells are separated and kept in the separate plastic bags. The collected molluscan specimens were identified by observing the morphological characters and special features with reference to available keys for identification of molluscs. The bivalves were mainly identified based on the shell morphology, hinge, interlocking dentition etc., and the gastropods on the shape, size, spire length and shape, with referred to standard literature available.

### 4. Result and Discussion

During the survey of the mangrove and molluscan species shows that there are very few species were observed at shirgaon. Mangrove species observed during the survey were 4 species of true mangroves representing 3 genera and 3 families namely, *Avicenia marina*, *Avicenia officinalis*, *Avicenia alba*, *Acanthus ilicifolis* and *Rhizophora mucronata*, 5 species of mangrove associates belonging to 4 families, namely *Ziziphus ziziphus*, *Caesalpinia bonduc*, *Derris trifoliata*, *Lantana camara*, *Calotropis gigantean* and 1 Genus 1 species of Non-mangrove hydrophytes *Sesuvium portulacastrum* respectively. Mangrove diversity along the Vaitarna estuary was studied. Only five species of mangroves were observed during the period of study. These were namely *Avicennia marina*, *Avicennia alba*, *Avicennia officinalis*, *Acanthus ilicifolius* and *Rhizophora mucronata*. Three species were belonging to family aviceniaceae where as 1 species from acanthaceae and 1 species from rhizophoraceae. In India a total of 82 mangrove species distributed in 52 genera and 36 families, has been recorded by different workers. Sundarban mangrove forest, West Bengal, shows the highest taxa diversity: 69 species, 49 genera, 35 families, including two species, viz. *Scyphiphora hydrophyllacea* and *Atalientia corea* reported for the first time from Indian (Mandal et al., 1995). Mangrove ecosystem of Indian Ocean region with about 55 mangrove species belonging to 22 genera 23 and 18 families from the Indian Ocean region. Species J

Table 1. List of observed mangrove areas of Shirgaon of Palghar district, Maharashtra

| Sr. No. | Kingdom  | Phylum   | Class      | Order           | Family       | Genus             | Species                      |
|---------|----------|----------|------------|-----------------|--------------|-------------------|------------------------------|
| 1       | Animalia | Mollusca | Gastropoda | Littorinimorpha | Littorinidae | <i>Littorina</i>  | <i>Littorina nera</i>        |
| 2       | Animalia | Mollusca | Gastropoda | Littorinimorpha | Epitoniidae  | <i>Melarhapha</i> | <i>Melarhapha neritoides</i> |
| 3       | Animalia | Mollusca | Gastropoda | Neogastropoda   | Volutidae    | <i>Pirenella</i>  | <i>Pirenella alata</i>       |
| 4       | Animalia | Mollusca | Gastropoda | Littorinimorpha | Littorinidae | <i>Littorina</i>  | <i>Littorina saxatilis</i>   |
| 5       | Animalia | Mollusca | Gastropoda | Littorinimorpha | Littorinidae | <i>Littorina</i>  | <i>Littorina littorea</i>    |

## Conclusion:

In conclusion, the study of mangroves and associated molluscan diversity at Shirgav of Palghar district has revealed the existence of a diverse and complex ecosystem. The study identified 10 mangrove species and 5 mollusc species, highlighting the ecological relationships between mangroves and molluscs. The study also revealed variations in soil type, water depth, and tidal inundation that influence the distribution and abundance of mangrove and molluscan species within the study area.

The study has important implications for conservation and management efforts in the region. The observed human impacts on the ecosystem, such as pollution and habitat loss, indicate the need for effective conservation and management strategies to protect the ecosystem from further degradation. The study can help identify areas of the ecosystem that are most vulnerable to human impacts and require protection.

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