

The gastropod fauna from Intertidal zone of Siridao beach, Goa, India

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ABSTRACT

The word Malacofauna constitutes the animals belonging to Phylum Mollusca. This is the second most diverse phylum and plays an important role in the biota. The present study aimed at evaluation of marine gastropod diversity and density in the intertidal zone of Siridao beach in Goa during pre-monsoon, monsoon and post-monsoon seasons, and their correlation with the prevalent physico-chemical parameters. Siridao beach is a mixed shore, interspersed by rocky and sandy intertidal region providing a wide range of microhabitats and niches to intertidal fauna. The duration of study was 12 months from February 2022 to January 2023 and sampling was carried out fortnightly, over the period, using Quadrat method during low tide. The study recorded a total of 40 marine gastropod, classified under 28 genera, 19 families and 9 orders were recorded during the twenty-four visits conducted, eight in each season. Highest number of species recorded, belonged to Family Neritidae, followed by Muricidae. The physico-chemical parameters studied were Surface water temperature, pH, Salinity and dissolved oxygen and the seasonal parameters. The relationship between the different parameters and the species diversity, species density and diversity indices, was established statistically. The present study adds to existing data about gastropods in Goa and also proves the ecological potential of the study site.

Key words : Malacofauna, Gastropod, Siridao, Goa

Introduction

Mollusca is the second largest phylum comprising of soft bodied organisms protected by calciferous exoskeleton. These cosmopolitan organisms are very susceptible to environmental changes and therefore serve as biomonitors or bioindicators. They play a very important role in the fields of economy, ecology and scientific research. They have a very productive role to play in the ecosystem.

India, situated north of the equator, is the seventh largest country in the world with approximately, 8000km long coastline extending across nine coastal states and two union territories (Pande *et al.*, 2014).

India is one among 12 mega biodiversity countries and 25 hotspots of the richest and highly endangered eco-regions of the world. India has extensive molluscan resources in the numerous bays, brackish waters and estuaries and in the seas around the sub-continent. About 3270 species of Molluscs belonging to different taxonomic groups, belonging to 220 families and 591 genera have been reported from India (Mohamed and Venkatesan, 2017).

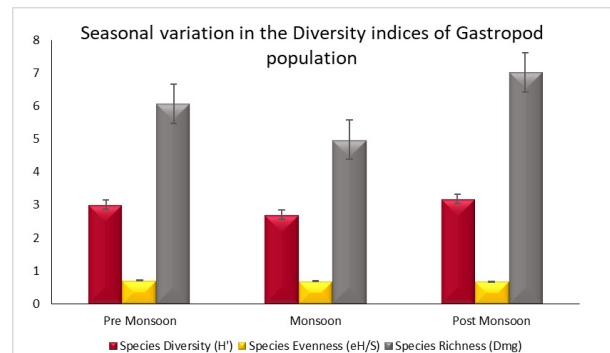
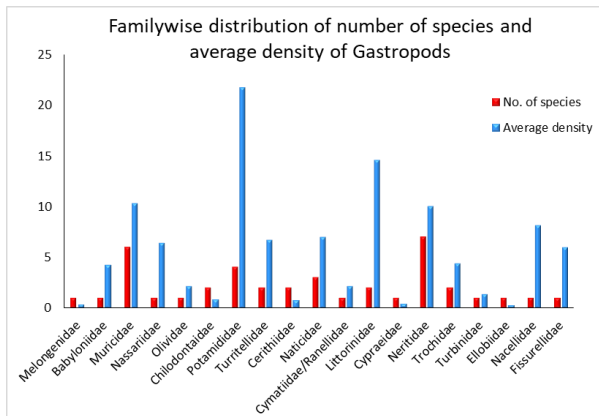
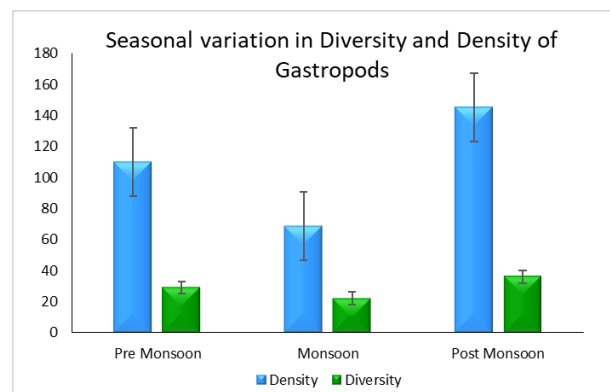
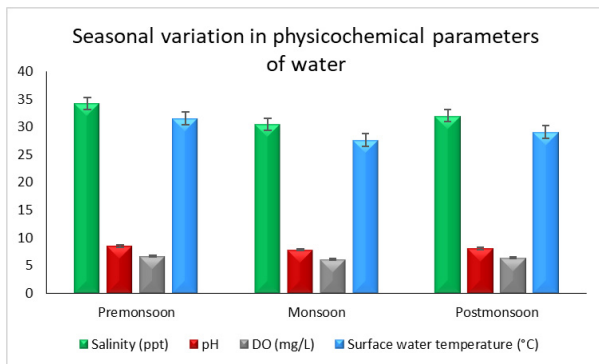
Goa is a state on the southern west coast of India. Goa comprises an area of 3,702 km² (1,429 Sq m). It lies between the latitudes 14°53'54" N and longitudes 73°40'13" E, lying on the slopes of Western Ghats facing Arabian Sea which stretches for 105

Km in width (Balasubramanian, 2017). This smallest state in India is popular for its excellent landscape, beautiful beaches and outstanding monuments. It is rich in terms of biodiversity, owing to its location on the Western Ghats range, a biodiversity hotspot (Lodrick and Wanmali, 2009). The temperature of Goa is moderate with not much variation. Goa receives rainfall from the southeast monsoon between the Months of June to September (Pai, 2016). Goa presents a wide- ranging habitat such as sandy beaches, rocky shores, mangrove patches and mud flats to a diverse array of shells. Gastropods and bivalves constitute the most Prominent classes of Mollusca found in Goa (Sonak, 2017).

Molluscs are triploblastic, coelomate, unsegmented and bilaterally symmetrical, soft bodied, heterogeneous group of animals (Venkatraman and Venkatraman, 2012), divided into a “head” and a “foot” with a visceral mass which is covered with a mantle (also known as a pallium) attached just inside the shell. Molluscs are cosmopolitan in distribution and occur in almost every habitat found on Earth (Wilbur and Yonge, 1964). Despite the fact that molluscs are very susceptible to changes in their environment because of their permeable skin and soft body, they have adapted to all of the main

realms of our planet that is marine, freshwater and terrestrial. In marine ecosystems, they are found mostly on a large variety of substrata including rocky shores, coral reefs, mud flats and sandy beaches (Khade and Mane, 2012).

In marine communities, they dominate the second trophic level and primarily feed on phytoplanktons. Molluscan fisheries and aquaculture are important industries and are becoming increasingly important as a source of medicines and other useful compounds (Ponder *et al.*, 2019). Molluscs play a very vital role in the fields of economy, ecology and scientific research. The economic usage is not restricted to food industry, but also extends to art and culture. Their shells and pearls obtained from them, are mostly used for decorative purposes and in handcrafted jewelry. In addition, the dead shells are used in manufacturing lime and cement (Santhiya *et al.*, 2013). Bivalve and gastropod molluscs serve as bio-indicators of water pollution, owing to their sensitivity to pollutants in ecosystems, making them useful for environmental bio monitoring (Putro, 2017). Molluscan communities also act as important recyclers of plant and animal waste. Thus, they play a vital role in keeping the water clean and healthy.



Materials and Methods

Study area

Siridao is located at the southern end of the Goa capital city of Panaji. It is situated near Zuari estuary. It is completely located on the island of Tiswadi taluka of Goa state. It is located on co-ordinates as 15° 26' 42.363 N, 73° 51' 17.893 E. It bears a rocky and sandy beach habitat. It is known as a paradise for molluscan shell collectors. A shell collector can

observe a wide variety of molluscan shells including oysters and pearl shells at the beach.

Methodology

The intertidal zone of Siridao beach was visited fortnightly from February 2022 to January 2023, during low tides. The expanse of the intertidal zone which approximates to around 1kilometer in length was sampled extensively using Quadrate method. The

Table 1. Gastropod species recorded from the intertidal zone of Siridao beach, Goa during the study period (February 2022 to January, 2023)

Order	Family	Scientific name
Neogastropoda	Melongenidae	<i>Volegalea cochlidium</i>
	Babyloniidae	<i>Babylonia spirata</i>
	Muricidae	<i>Indothais lacera</i>
		<i>Indothais javanica</i>
		<i>Purpura bufo</i>
		<i>Semiricinula tissoti</i>
		<i>Semiricinula konkanensis</i>
		<i>Murex trapa</i>
		<i>Nassarius stolatus</i>
		<i>Agaronia gibbosa</i>
Seguenziida	Olividae	<i>Euchelus asper</i>
	Chilodontaidae	<i>Euchelus asper tricarinatus</i>
		<i>Telescopium telescopium</i>
Caenogastropoda	Potamididae	<i>Cerithideopsisilla</i> sp.
		<i>Potamides</i> sp.
		<i>Pirenella</i> sp.
		<i>Turritella duplicata</i>
		<i>Turritella terebra</i>
		<i>Clypeomorusbatillariaeformis</i>
		<i>Clypeomorus bifasciata</i>
		<i>Natica picta</i>
		<i>Natica maculosa</i>
		<i>Neverita didyma</i>
Littorinimorpha	Cymatiidae/Ranellidae	<i>Gyrineum natator</i>
		<i>Littoraria scabra</i>
	Littorinidae	<i>Littoraria coccinea glabrata</i>
		<i>Palmadusta lentiginosa</i>
		<i>Nerita Oryzarum</i>
Cycloneritida	Cypraeidae	<i>Nerita litterata</i>
		<i>Neritina violacea</i>
		<i>Nerita chamaeleon</i>
		<i>Nerita balteata</i>
		<i>Clithon faba</i>
		<i>Nerita polita</i>
		<i>Trochus radiatus</i>
		<i>Trochus nigropunctatus</i>
		<i>Turbo bruneus</i>
		<i>Pythia plicata</i>
Trochida	Trochidae	<i>Cellana radiata</i>
		<i>Diodora lima</i>
Ellobiida	Ellobiidae	
Patellogastropoda	Nacellidae	
Lepetellida	Fissurellidae	

sample collection method employed was handpicking or dredging. Live specimen was avoided to prevent ethical issues; however, they were photographed using Canon 1500D DSLR camera with Canon 18- 55 mm lens. The collected samples were cleaned, stored and identified using available literature (Apte, 2014 and Sonak, 2017). The statistical analysis of the observations recorded was done using software such as Microsoft Excel and Past 4.03.

The physico-chemical parameters such as Salinity, Surface water temperature and pH were estimated using Refractometer, Thermometer and digital pH meter respectively. The dissolved oxygen was estimated using Winkler's Iodometric method (Winkler, 1888). The weather data was obtained from India Meteorological Department.

Results and Discussion

A total of 40 species belonging to 28 genera, 19 families and 9 orders were recorded over the period of 12 months. The diversity and density of gastropods was highest during Post monsoon season, followed by pre monsoon and least during monsoon season. This is by virtue of optimum ecological conditions prevalent during post and pre monsoon season. The diversity and density showed positive correlation with atmospheric temperature, salinity, pH, dis-

solved oxygen and surface water temperature, whereas negative correlation with rainfall. Maximum number of species were recorded from Family Neritidae and highest population density from Family Potamididae.

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Conflict of interest: Nil F]

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