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## **EXPLORING COASTAL BIVALVES AND GASTROPODS: A CHECKLIST FROM ONJAL MACHHIWAD COAST, SOUTH GUJARAT, INDIA**

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### **ABSTRACT:**

The study conducted on the Onjal Machhiwad coast, Navsari, Gujarat, aimed to assess the intertidal bivalve and gastropod assemblages over a period of twelve months from January 2023 to February 2024. The sampling site, formed by black sand featured an intertidal zone extending approximately 1.5-2 km during ebb tide. Specimens of gastropods and bivalves were randomly collected from the intertidal zone and supralittoral zone, total 15 species identified, with nine belonging to Bivalvia and six to Gastropoda. The highest number of species was found in Neogastropoda (Class Gastropoda) and Arcida (Class Bivalvia). The identified specimens were preserved and deposited in the aquatic biodiversity museum at the College of Fisheries Science, Navsari. This is the first work done exploring the diversity of Bivalves and Gastropods.

**KEYWORDS:** *Gastropoda, Bivalvia, Diversity, Onjal Machhiwad, Navsari.*

### **INTRODUCTION:**

The phylum Mollusca, the second-largest animal phylum, comprises a diverse array of organisms that are globally distributed across various periods (Bouchet, 1992). Their fossil record dates back to the Cambrian period, with approximately 45,000 fossil species identified (Storer et al., 1979), while there are currently over 80,000 living species. Gastropods,

which include snails, slugs, and their relatives, are incredibly diverse in terms of species, structure, and habitat. The monophyletic nature of Gastropoda is attributed to shared characteristics such as the larval operculum, torsion mechanism, and the concentration of organs within the visceral mass (Leal, 2002). These distinctive features collectively indicate a common evolutionary origin for gastropods, underscoring their classification as a unified and genetically related group. Shelled gastropods and bivalves hold significant economic value (Carpenter and Niem 1998, Floren 2003). They are extensively harvested for consumption as food, and their shells find diverse applications in handicrafts. In India, there are approximately 3,271 known mollusk species, with about 1,900 of them being marine gastropods (CMFRI, 2019).

Based on the literature, the Indian has documented 652 species of marine bivalves, spanning 173 genera, 69 families, 11 orders, and 4 subclasses. Among these, 88 species are indigenous to India (Tripathy and Mukhopadhyay, 2015). In Gujarat, recent surveys have recorded 77 species of marine bivalves (Arathi *et al.*, 2017). On the north coast of India, Kardani (2011) identified 16 species of bivalves. The present study focuses on the bivalve and gastropod fauna of Onjal Machhiwad, a fishing village on the southern coast of Gujarat, India. While the region's marine resources have received attention, no prior research has specifically investigated the diversity of gastropods and bivalves in this unique habitat. This study aims to establish a preliminary checklist of these mollusk groups, laying the groundwork for a more comprehensive assessment of marine biodiversity along the South Gujarat coast.

### ***MATERIAL AND METHODS:***

The current study was conducted on the Onjal Machhiwad coast, Navsari (20°49'38.01"N, 72°49'18.88"E), Gujarat. The sampling coast was rich in Black sand, with an intertidal zone exposed for around 1.5-2 km during the ebb tide. Sampling was carried out from January 2023 to February 2024. Specimens of gastropods and bivalves were collected randomly from the intertidal zone and supra-intertidal zone. Only 5–10 voucher specimens of unknown species were handpicked, stored in plastic bags with labels, and brought to the College of Fisheries Science, Navsari. Specimens were cleaned with a brush and rinsed with water to remove algal film and debris, they were identified based on morphological characteristics like shape, color, and shell characteristics. Specimens were taxonomically identified using standard identification keys (Manual on the Identification of Schedule Mollusks from India, FAO species identification guide or fishery purposes (Carpenter and Niem, 1998), CMFRI series on marine gastropods of shellcraft value. The validation of the species was done using the World Register of Marine Species (WoRMS) database. Photographs of each species were captured using a camera. All specimens were fixed and preserved in 70% ethanol. The

identified specimens were deposited and displayed in the aquatic biodiversity museum at the College of Fisheries Science, Navsari.

### **RESULT AND DISCUSSION:**

Intertidal bivalve and gastropod assemblages were investigated over twelve months. A total of 15 species were identified, with nine belonging to Bivalvia and six to Gastropoda. In class Gastropoda, the Muricidae family exhibited the highest species richness. Notably, *Pholas campechiensis* and *P. orientalis* of the family Pholadidae were the most abundant species in the class Bivalvia, with an average length of approximately 4 centimeters. Order Neogastropoda of Gastropoda and Order Arcida of class Bivalvia had highest species diversity.

According to the study by the Ministry of Water Resources, Govt of India, due to the discharge of five rivers in the Navsari district of south Gujarat, an alluvial plain is formed, followed by barren sand strips in the coastal areas, that are enriched by the organic matter released from the Arabian Sea that creates the black sand beach, a few patches of volcanic rocks present in the intertidal zone. This forms the habitat for species of both gastropods and bivalves.

Most of the specimens were collected from the soil surface, some specimens had barnacles attached to them. The species *Anomia achaeus* was found attached to the rock in the intertidal zone. Most of the species are yet to be assessed for their conservation status, and only one species *Conus ambiguus* was assessed and categorized as 'least concern'. The present study here concludes the first prepared checklist of bivalves and gastropods from Onjal Machhiwad coast, on the southern coast of Gujarat.

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**Table 1: List of Species**

Sr. No.	Class	Order	Family	Species	Common name	IUCN Status
1	Gastropoda	Littorinimorpha	Cypraeidae	<i>Mauritia arabica</i>	Arabian cowry	Unassessed
2		Neogastropoda	Muricidae	<i>Indothais lacera</i>	Carinate rock shell	Unassessed
3				<i>Stramonita haemastoma</i>	Red-mouthed rock shell	Unassessed
4			Conidae	<i>Conus ambiguus</i>	Ambiguous cone	Least concern
5			Nassaridae	<i>Bullia vittata</i>	Banded winkle	Unassessed
6		Elloboiida	Ellobiidae	<i>Ellobium dominicense</i>	West Indian rock snail	Unassessed
7	Bivalvia	Arcida	Aracidae	<i>Anadara senegalensis</i>	Senegal ark	Unassessed
8				<i>Tegillarca nodifera</i>	Nodifer ark	Unassessed
9				<i>Anadara cornea</i>	Blood ark	Unassessed
10		Venerida	Mactridae	<i>Mactra luzonica</i>	Luzon troughshell	Unassessed
11			Veneridae	<i>Paratapes textile</i>	Textile venus clam	Unassessed

Sr. No.	Class	Order	Family	Species	Common name	IUCN Status
12		Myidae	Pholadidae	<i>Pholas campechiensis</i>	Florida fighting conch	Unassessed
13				<i>Pholas orientalis</i>	Oriental piddock	Unassessed
14		Pectinida	Anomiidae	<i>Anomia achaeus</i>	Saddle oyster	Unassessed
15		Cardiida	Donacidae	<i>Donax venustus</i>	Venus clam	Unassessed

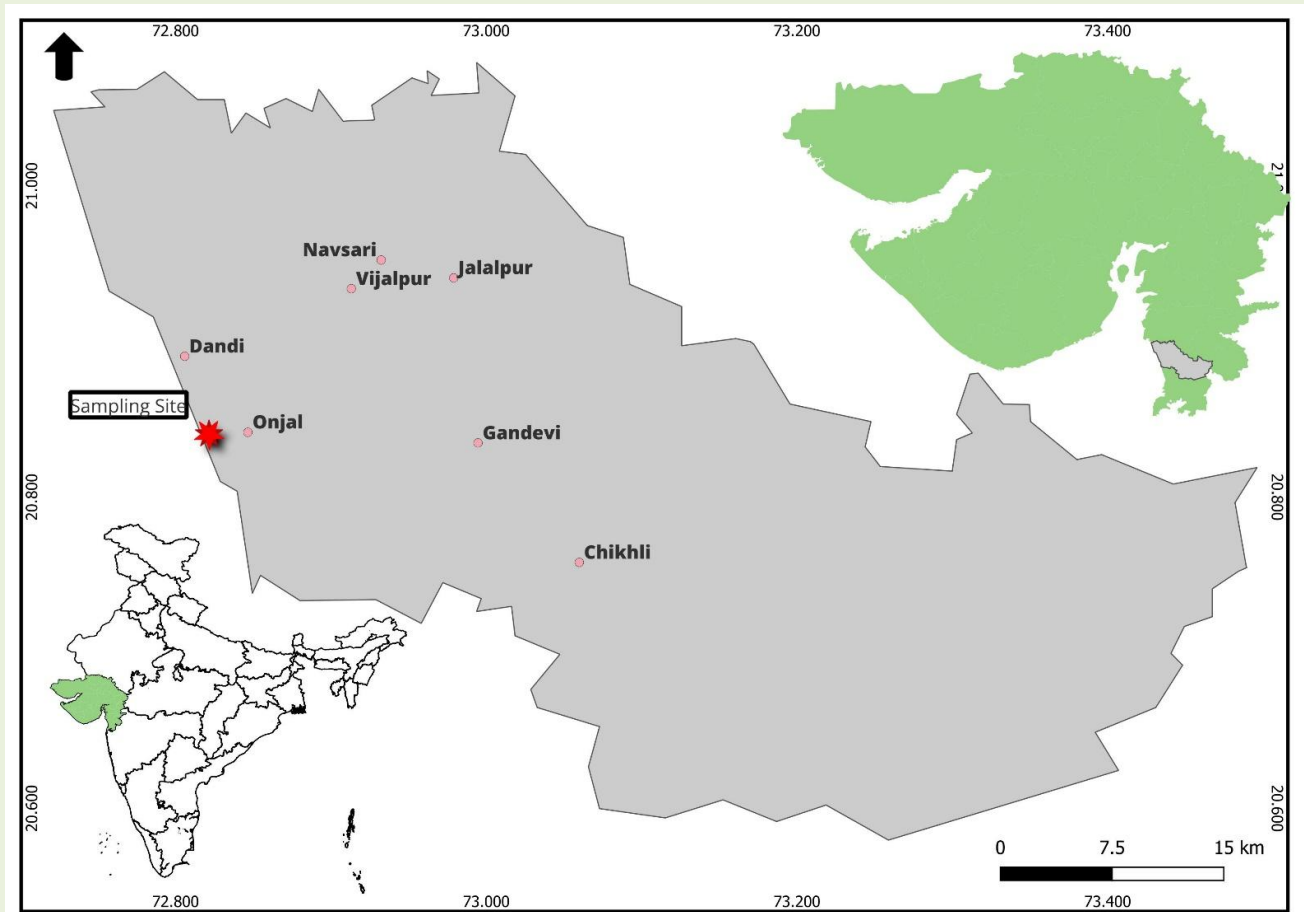


Fig 1: Location of Sampling



**Fig 2: Images of Listed species a) *Tegillarca nodifera* b) *Anadara senegalensis* c) *Anomia achaeus* d) *Donax venustus* e) *Mactra luzonica* f) *Anadara cornea* g) *Pholas campechiensis* h) *Pholas orientalis* i) *Paratapes textile* j) *Ellobium dominicense* k) *Bullia vittata* l) *Conus ambiguus* m) *Indothais lacera* n) *Stramonita haemastoma* o) *Mauritia arabica***