

# Underwater-Coastal Diversity, Statistical Analysis of Species Distribution

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## ABSTRACT

Diversity of bivalve and Gastropod molluscs was studied twice in each season monsoon, post monsoon, winter and summer July 2016 to June 2017. At each locality diversity of species were collected from Bhatye estuary, Shirgaon creek, Mirya, Bhawati-bander and local markets. From various locality like rocky habitat, Muddy habitat, Sandy beaches including Mangrove areas, these study localities is a wide chance of research to further explore both on the possibility of commercial value and ecosystem conservation.

**Keywords:** Edible Bivalve, Gastropod Molluscs, Diversity.

## I. INTRODUCTION

'index of diversity' defined by Fisher are two measures of the degree of concentration or diversity achieved when the individuals of a population are classified into groups. Both are defined as statistics to be calculated from sample data and not in terms of population constants. The index of diversity has so far been used chiefly with the logarithmic distribution. It cannot be used everywhere, as it does not always give values which are independent of sample size; it cannot do so, for example, when applied to an infinite population of individuals classified into a finite number of groups [26].

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<sup>1</sup>. Edible species of oysters, mussels, cockles, and gastropods are collected extensively for local consumption. The blood clam, *Anadara granosa* and other cockles can be found in large numbers in mudflats on mangrove strands, where it lies partially

buried in the sediment<sup>2</sup>. The total number of mangrove inhabiting faunal species in Indian mangroves is 3,111, which include prawns, crabs and molluscs, fish, fish parasites, insects, reptiles, amphibian and mammals<sup>3</sup>. An oysters, mussels, clams serve the nutritional needs source of minerals, protein, glycogen and easily digestible compared to other animal food<sup>4</sup>. In India, till today, 5,070 molluscs have been recorded of which, 3,370 are from marine habitats<sup>5</sup>. Eight oysters, two mussels, seventeen clams, six pearl oysters, four giant clams, one window pane oyster, other gastropods fifteen cephalopods are exploited from the Indian marine region<sup>6</sup>. The present papers investigate the diversity of bivalve and gastropod molluscs of mangrove ecosystem in selected study area of Raigad district coast.

## II. METHODS AND MATERIAL

Live animals were collected twice in each season monsoon, post monsoon, winter and summer July 2016 to June 2017. From Bhatye estuary, Shirgaon creek,

Mirya (rocky shore), and Bhagwati bander (rocky shore), Ratnagiri coast where as Kajali river meets to the sea. Soon after fishing, they were brought to the laboratory and the shells were brushed to clean the fouling biomass and mud. They were then stocked in filtered seawater pumped in the laboratory from the estuary for observation then animal preserved in 70% alcohol for taxonomical identification of external structure of typical shells, especially, lunal, umbo, and operculum. Internal parts teeth, adductor muscles, hinged scars. The shells were identified from Zoological Survey of India, Kolkata.

### III. RESULTS AND DISCUSSION

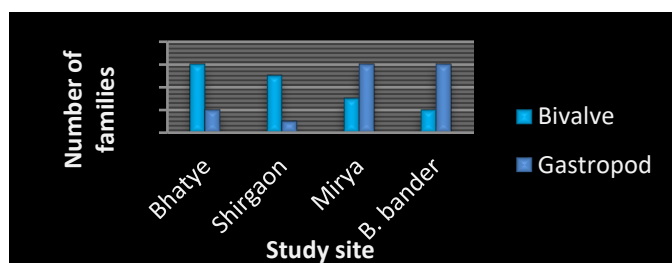
The total 12 bivalves from 7 families and 13 gastropod species from 8 families of edible molluscs from four localities of Ratnagiri were recorded (Tables 1 & 2).

Class	Bhatye (1)	Shirgaon (2)	Mirya (3)	B. bander (4)
Bivalve	6	5	3	2
Gastropod	2	1	6	6

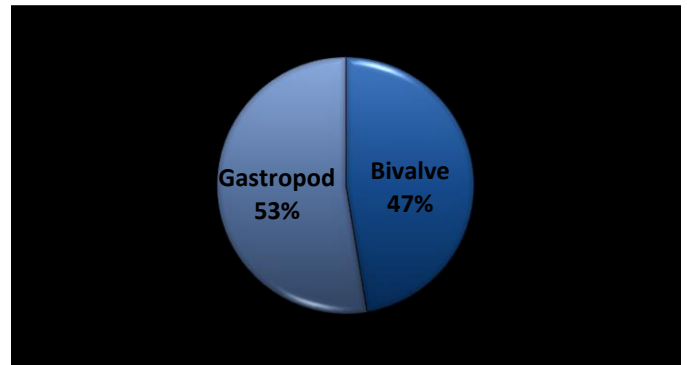
**Table 1. Localities wise family distribution of Ratnagiri coast.**

Study site	Bivalve	Gastropod
1	9	2
2	8	1
3	4	11
4	3	10

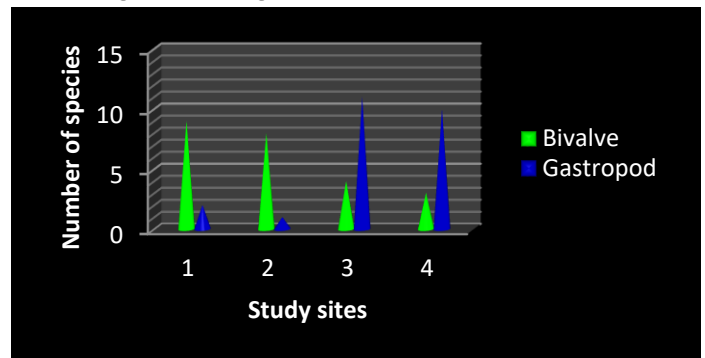
**Table 2 Localities wise species distribution of Ratnagiri Coast.**



**Figure no. 1 Showing edible bivalve and gastropod by localities of Ratnagiri coast.**



**Figure no. 2 Showing edible bivalve and gastropod in percentage of Ratnagiri coast.**



**Figure no. 3 Showing localities wise edible bivalve and gastropod of Ratnagiri coast.**

The 52% gastropod species and 48% bivalve species found from the selected study localities of of Ratnagiri coast. Bivalve species were found higher at Bhatye estuary while gastropods species were higher in Mirya probably due to habitat differences. The overall molluscs diversity was found higher (13 including bivalve and gastropod species) while lower at Mirya bander. Decomposed material of the plant litter from August onwards is an important component of nutrient cycling in wetlands and it harbours a large number of diverse species<sup>7</sup>. in the month of July, the salinity and temperature dropped down which made the condition adverse for the molluscs<sup>10</sup>. It is good harvesting place for variety of molluscan species<sup>7</sup>. Molluscs populations in mangrove ecosystem is important to evaluate their condition<sup>11</sup>. In Malaysia some of marine bivalve such as *Anadara granosa* is being cultured for commercialization. In Sarawak mangrove forest covered 173,792 ha of the land which is suitable for molluscan habitat<sup>12</sup>. The bivalves in favor of the more

active and therefore more conspicuous mangrove, with chemo-symbiotic associations have also been reported<sup>13</sup>. The hard substratum is available such as prop-roots and pneumatophores and oysters beds<sup>14</sup>. The numerical abundance and biomass of molluscs can be equally impressive<sup>15</sup>. The numerous investigation of mangroves associated molluscs in the world wide, 39 species of gastropods in as Australian mangrove<sup>16</sup>. Twenty eight species in the Chinese mangrove<sup>17</sup>. Twenty three molluscs species from the mangrove forest in Hong Kong<sup>18</sup>. Twenty nine bivalves from the mangrove root on the Atlantic coast of Colombia and Wood-boring bivalves are also common in the mangrove forest<sup>19</sup>. Fourty four species of Sematan mangrove forest of Malaysia<sup>20</sup>. In general, numerous surveys of Indian mangrove molluscs were reported by<sup>21&22</sup>. A total account of Sundarban 56 species of molluscs including 31 gastropods and 25 bivalves<sup>23</sup>. 12 bivalves and 13 gastropods mangrove associated at Ratnagiri <sup>24</sup>. Gastropods are typically one of the dominant and most conspicuous macrofauna in mangrove systems, and occupy wide range of ecological niches<sup>25</sup>.

#### IV. CONCLUSION

The diversity of edible molluscs at four localities at Ratnagiri varies significantly. During the study period 53% gastropod species and 47% bivalve species recorded on selected localities of Ratnagiri coast (given in figure no 1.). There was a considerable difference within the study localities. High species diversity was found in a certain locality it was due to the presence of higher number of different species. The molluscs are indigenous species of Bhatye estuary have greater commercial value and biodiversity importance. The total numbers and type of edible molluscs probably is influenced by habitat and geographical condition. Shirgaon creek and Bhatye estuary probably have suitable habitat to support large number of edible molluscs diversity.

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