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**Marine gastropods distribution, taxonomy and statistical analysis, along west coast of India**

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**Abstract**

The marine biodiversity of the west coast of India is rich and much of the world's wealth of biodiversity is found in highly diverse coastal habitats. A present study was carried out on marine gastropod accessibility among Raigad district coastline to collection, taxonomical identification and diversity according to Shannon Wiener Diversity Index. A collection made by rocky platform, boulder field, some sheltered areas sandy beaches, and muddy habitat during October 2018 to September 2019. SCUBA diving used during the study for collection, The molluscan fauna is rich in prevalence of various habitats, so there is urgent need to taxonomical study of gastropods molluscs as well as sustainable utilization in the point of view of biodiversity conservation.

**Keywords:** Gastropods, taxonomy, statistical analysis, Raigad, west coast of India.

**1. Introduction:**

India is mega Biodiversity County, 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, inter tidal flats, mangrove areas [1]. 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 [2]. The gastropods are collected extensively for local consumption. Mangrove roots & lower parts of trunks provide substrate for oysters and mussels. Because these animals are filter feeders, they are confined to microhabitats below mean high water and are usually only abundant in areas adjacent to open water [3]. 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 other animal food [4]. In India, till today, 5,070 species of molluscs have been recorded of which, 3,370 are from marine habitats [5]. The gastropods such as sacred chank, *Trochus*, *Turbo* are exploited from the Indian

marine region [6]. The present papers investigate the diversity of gastropod molluscs of mangrove, rocky coasts, and sandy beach from selected study stations of open coast of Raigad district.

**2. Materials and Methods:**

In the present study were collected from five stations namely Awaas (Lat. 18°46.068"North and Long. 072°51.817'East), Sasvane (Lat. 18°47.159" North Long. 072°51.760"East), Kolgaon (Lat. 18°48.197" North Long. 072°52.660" East), Mandva (Lat. 18°48.324" North and Long. 072°52.967" East), Kopropli (Lat. North 18°47.669"and Long. 072°54.305"East) coastline of Raigad district west coast of India, The sampling was done randomly from intertidal region at five stations also from sea with the help of SCUBA diving collection done as per need. The five quadrates of nylon rope each 1-m<sup>2</sup> was used, data were collected twice in each season post-monsoon, winter and summer October 2018 to September 2019. Soon after collection of live animals, 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 localities for observation then animal preserved in 70% alcohol for

taxonomical identification of morphological characters of typical animal, especially, lunal, umbo, and operculum. Internal parts teeth. The shells were identified from Zoological Survey of India, Kolkata, also using the reference [19], special guidance taken for identification by Dr.Sherly Slack, Australia for identification.

**3. Results:** In the present study were documented 18 species of gastropods belonging to 18 genera out of 11 families from

the coast line of Raigad district, west coast of India. A study five stations respectively Awas station: 8 species belonging 8 genera out of 6 families, Saswane station: 6 species belonging 6 genera out of 4 families, Kolgaon station: 6 species belonging 6 genera out of 4 families, Mandva station: 5 species belonging 5 genera out of 3 families, and Koproli 9 species belonging 9 genera out of 5 families, documented.

**3.1: According to Shannon Wiener Diversity Index**

| No. of sample | pi=sample/sum | ln (pi) | pi*ln (pi)   |
|---------------|---------------|---------|--------------|
| 08            | 0.235         | -1.448  | -0.340       |
| 06            | 0.176         | -1.737  | -0.305       |
| 06            | 0.176         | -2.737  | -0.305       |
| 05            | 0.147         | -1.917  | -0.281       |
| 09            | 0.264         | -1.331  | -0.351       |
| sum=34        |               |         | Sum = -1.582 |

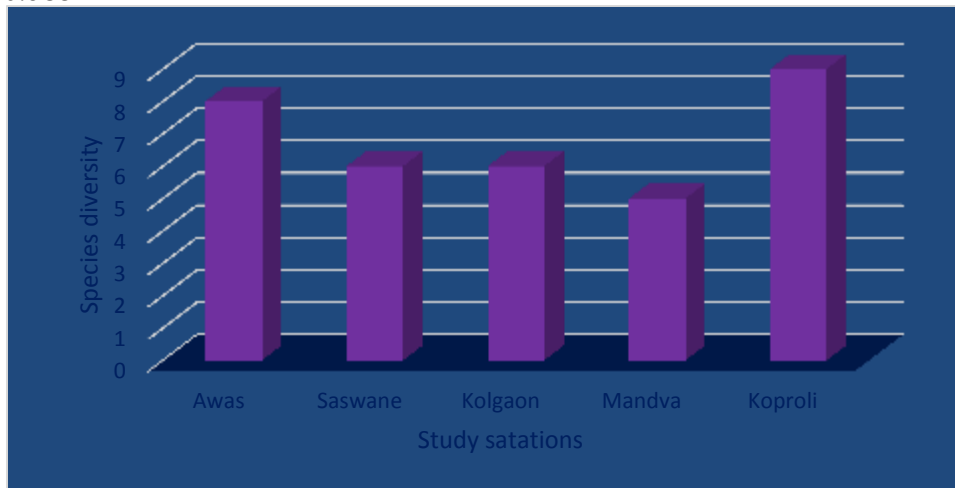
**H= 1.582**

$H_{max} = \ln(N) = \ln(5) = 1.609$

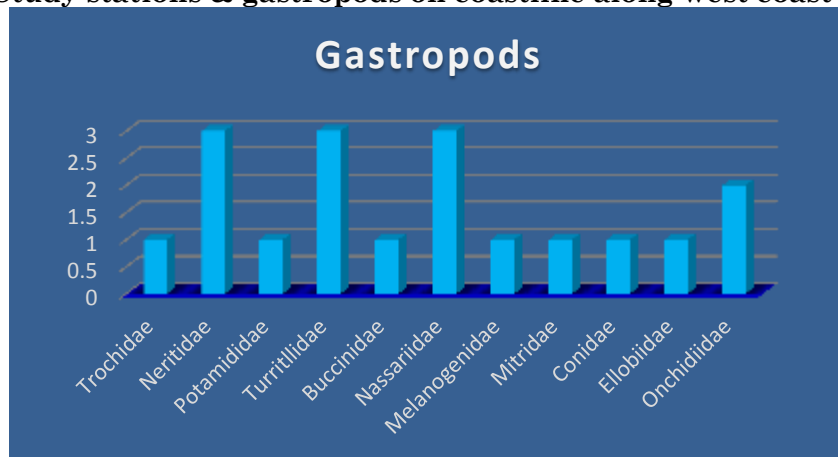
Evenness =  $H/H_{max} = 1.582/1.609 = 0.983$

Result: Shannon diversity index (H) = 1.582

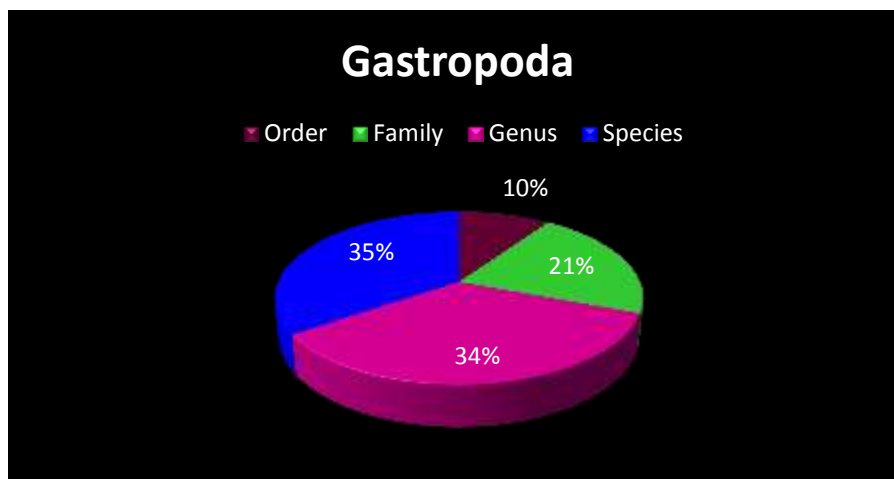
Evenness = 0.983



**GRAPH NO.I. Study stations & gastropods on coastline along west coast of India.**



GRAPH NO.II. Families &amp; gastropods on coastline along west coast of India.



GRAPH NO.III.

#### Total account of gastropods on coastline along west coast of India.

According to "graph 1" The station Koproli documented maximum diversity, According to "graph no 2" family Neritidae, Nassariidae and Turritellidae documented rich diversity. According Shannon diversity index (H) = 1.582 while Evenness is the 0.983.4.

**Discussion: 4.1:** The diversity of gastropods molluscs at five stations of Raigad district coast varies significantly. The pulmonate snail *Cassidula nucleus* has been studied from Pichavaram mangroves [8]. The *Nerita (Dostia) crepidularia* in vellar estuary mangroves, its having a variety of habitats mangroves plant on the stems, intertidal mudflat during the high tide time animals moving to plant stem after that during low tide time animals moving to mud flats [9]. The lowest density was in the month of July because of monsoon season. In monsoon, due to self-dilution of the body fluid, the sensitive molluscs were unable to adjust the fluctuating osmotic balance quickly hence their mortality was high. After the month July because of adjustment, the mortality rate of molluscs decreased gradually. As a result, density of molluscs increased. It also understood that in the month of July, the salinity and temperature dropped down which made the condition adverse for the molluscs [10]. The population density was at its peak in the month of November during post monsoon period. It is clearly noticed by many research workers that the post monsoon period is the most favorable time for

the new inflow of molluscan species. The mangroves support high density of every type of molluscan species especially, *Telescopium*, *Potamides*, *Natica*, *Nerita*, and *Littorina* and oysters. The *Littorina sp.* was densely found on the trunks, pneumatophores as well as on stilt roots of mangrove plants. It is good harvesting place for variety of molluscan species [7]. **4.2:** The gastropods are generally benthos organism and they are regularly used as bio-indicators of aquatic healthy. These species can produce a billion of larvae in the form of planktons that sustains the biotic population & they have an essential role in food chain, & energy flow. The observation of these species populations in mangrove ecosystem is important to evaluate their condition [11]. In the region of *Nerita (Dostia) crepidularia*, *Littorina sp.*, *Cerithidea sp.* were observed to the mud banks, mudflats, mangrove forest, sandy muddy area swamps, prop-roots and pneumatophores. *Telescopium telescopium* were found in the mud flats of mangroves plants. **4.3:** Molluscs can reach high biomass in mangroves ecosystem because of high primary production within the food web, as predators, herbivores, detritivores & filter feeders. The numerical abundance & biomass of molluscs can be equally impressive. The numerous investigation of mangroves associated molluscs in the world wide, 39 species recorded of gastropods in as Australian mangroves, [12]. 23 molluscs species from the mangrove forest in Hong Kong [13]. 44 sp., of Sematan mangrove

forest of Malaysia recorded [14]. A total account of Sundarban 56 species of molluscs 31 gastropods & 25 bivalves [15]. 12 bivalve & 13 gastropods mangrove associated molluscs at Ratnagiri recorded [16] 39 gastropods belongs 15 families from Raigad district coast recorded [17]. The calcium concentration is varied in different gastropods shells, these shells can be used for preparation of calcium for the medicinal purpose [18]. Gastropods are typically one of the dominant and most conspicuous macrofauna in mangrove systems, and occupy wide range of ecological niches.

#### Conclusion:

The present study recorded from study stations Koproli, Awas, Saswane, Kolgaon and Mandva coast line of Raigad, west coast of India has greater diversity of gastropods and their commercial as well as it has a significant ecological role to play in the mangrove ecosystems, also rocky habitats is suitable especially for gastropods. it is necessary to document the diversity of the group of threatened ecosystems. There is an urgent need conservation & sustainable utilization of gastropod molluscan species.

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