ORIGINAL RESEARCH PAPER | Zoology | Volume : 6 | Issue : 10 | October 2016 | ISSN - 2249-555X | IF : 3.919 | IC Value : 74.50

Study of Some Shell Morphology of Clams Found in and Around Mumbai

KEYWORDS: Gafrarium divaricatum, Meretrix casta, Arca granosa, Polymesoda erosa, Semele cordiformis, Mumbai coast, intertidal zone, shell morphology.

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ABSTRACT *Clams are diverse group of edible bivalves, typically characterized by two part calcareous shell that are hinged, more or less symmetrical and a laterally compressed muscular hatchet shaped foot inhabiting in sand or mud. They are of commercial, culinary and ecological importance. In addition they are important for maintaining water quality through their remarkable ability to filter large quantities of water. Clams show notable variation in their morphological characters of the shell from one species to the next. In the present study, clams available in the intertidal area in and around Mumbai coast were collected from six different sites. Morphological characters such as colour of the shell, length (L), height (H) and width (W) of shells of clams Gafrarium divaricatum, Meretrix casta, Arca granosa, Polymesoda erosa and Semele cordiformis were studied. Although in Gafrarium divaricatum, Meretrix casta, Arca granosa, Semele cordiformis shell length > height > width, Polymesoda erosa showed less variation in length and height. Less number of clams in the selected sites exhibits deterioration of intertidal zone of Mumbai which demands greater attention and immediate monitoring.*

INTRODUCTION

Globally, clams provide nutritional, economic, cultural and aesthetic needs of man. Clams tend to be an exceptionally rich source of vitamin B_{12}, protein and niacin. They are a major source of food worldwide and the focus of important fishery and aquaculture industry. Ecologically, they play a key role in food chains, filtering plankton from the water and further being preyed upon by various fishes and other predators. Often coastal foraging birds, worms, crustaceans, fish, molluscs and other marine species like starfish, selectively consume clams. Clams show a remarkable variation in their morphological characters such as shape, size, thickness, colour and degree of sculpturing of the shell from one species to the other. Various environmental factors are known to affect bivalve shell morphometry such as latitude, depth of distribution, tidal excursion or shore level, water movements such as waves, turbulence and currents, type of sediments, salinity, type of natural predators and trophic conditions. Shell shape is often used as the primary means of characterizing species and genera and it is occasionally used to diagnose higher taxa (Hershler and Ponder, 1998). In the present investigation, some morphological characters – colour of the shell, length, height and width of shells of clams found in and around Mumbai were studied. Phenotypic plasticity of bivalve shell morphometry has long been reported in the literature (Milley et al, 2014). Shell measurements are particularly important because they are readily accessible and exhibit less variance than most soft part measurements (Dhillon, 1984).

MATERIAL AND METHODS

A survey of areas in and around Mumbai for the collection of clams was done and six sites of seashore were identified. These shores were visited during low tide by referring to the tide calendar. Clams were handpicked randomly during low tide from Worli-Haji Ali, Bandra bandstand, Khardanda, Belapur, Vashi and Uran. The collected clams from each site were identified by their morphological characters like shell colour, shape, length, height and widths. The total shell length that is the maximum distance on the anterior posterior axis, height, the maximum distance on the dorsal-ventral axis, across the shell middle axis and width, the maximum distance on the lateral axis between both valves of the closed shell. The total shell length, height and width of the clams were measured to the nearest 0.01 mm with a Vernier caliper.

RESULT

Graphs of individual clam species were plotted for shell length, height and width as shown in Figure I, II, III, IV and V.

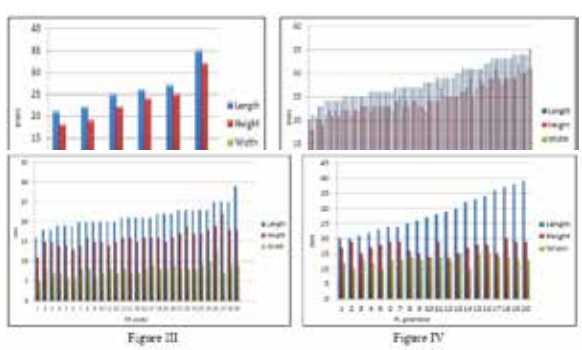
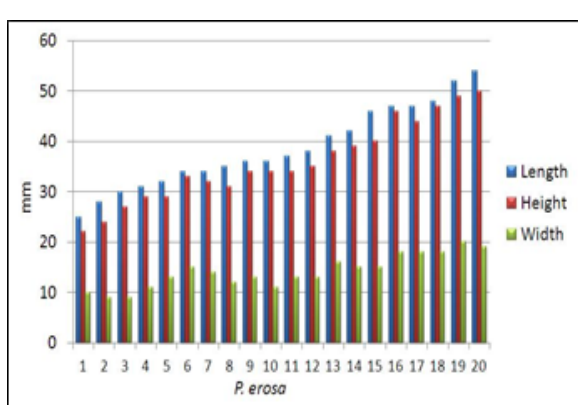


Figure III Figure IV



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DISCUSSION

Maximum shell length of *Gafrarium divaricatum* was 3.5 cm with an average shell length of about 2.8 cm. This is in agreement with earlier findings (Jaiswar, 2002). The colour of the shell varied from cream, light yellow, straw yellow often with brown V shaped forked markings more prominent at the edges. The overall shell surface showed concentric radial ribs with reticulate appearance. Maximum shell length of *Meretrix casta* was 2.9 cm with an average shell length of about 2.13 cm. Laxmilatha, (2013) studied the population parameters of *Meretrix casta* from two estuaries along the coast of North Kerala, Southern India. The size range of *Meretrix casta* contributing to fishery in Chaliyar estuary was 15.8 - 33.4 mm, whereas, in Kavvai estuary its size ranged from 10.8 - 37.8 mm. Shell colour of *Meretrix casta* varied from dirty brown to yellowish orange with a black band on one edge of the shell. Maximum shell length of *Polymesoda erosa* was 5.4 cm with an average shell length of about 3.87 cm. This is in agreement with earlier reports (Gimmin et al, 2004). Shell dark yellowish green in colour. Maximum shell length of *Arca granosa* was 3.9 cm with an average shell length of about 2.84 cm. Souji and Tresa, (2013) reported, *Tegillarca granosa* size 1.2 - 1.8 cm collected from Thiruchendur, Tamil Nadu, India. Colour of the shell was pale white. Maximum shell length of *Semele cordiformis* was 3.5 cm with an average shell length of about 2.6 cm. Colour of the shell was creamish white. Less number of *S. cordiformis* during collection was noted from different sites as compared to the other clams.

CONCLUSION

Overall in the present study the different selected sites showed less number of clam species, some sites even showed absence of clams as compared to earlier reported work (Sundaram and Deshmukh, 2011). This points to the deteriorating habitat due to anthropogenic activities, garbage disposal at these sites and meagre attention given to safeguard the natural fauna in the intertidal areas. It warranties thorough monitoring of Mumbai coast to save the present dwindling number of clams and bivalves, which once thrived in large numbers along the shore.

Acknowledgement

Author would like to thank Dr. A. S. Khemnar, Director, The Institute of Science, Mumbai and Dr. A. P. Manekar, Head of the Zoology Department, The Institute of Science, Mumbai

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