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ORIGINAL RESEARCH ARTICLE

Biomass Variations in the Bivalves Fauna of Selected Tidal Flats of East Coast In India

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ABSTRACT

The present study was conducted to study the biomass variations in different wetlands at East coast of India, during August 2011 to December 2011. The 5 different molluscan species such as *Meretrix casta*, *Meretrix menet*, *Donax cuneatus*, *Perna viridis* and *Phaphia textile* were collected from 4 different wetlands such as Pichavaram, Poombukar, Karaikal and Nagappattinam. Among the collected species, *Meretrix meretrix* showed highest value in 62.876 gm (animal weight), 53.087 gm (shell weight), 7.783 gm (Flesh weight), 2.006 gm (Dry weight), 0.984 gm (Ash free dry mass weight), 7.778 gm (water weight) recorded from Pichavaram coast, and Ash weight was highest in 0.921 gm recorded from Nagappattinam coast. The lowest values were recorded from 4 different wet land and 5 different species.

Keywords: Biomass variation, Molluscan fauna, Wetlands and East coast.

1. INTRODUCTION

The growth rate of many species of molluscs has been studied using different techniques such as labelling annual growth rings and the distribution of size cochorts. An interesting feature to growth of molluscs is its variation in rate during development based on environmental conditions. Furthermore, shells are utilization for making line studies on the growth of this species. Therefore, in the present study, the morphometric measurements are included to the variation among the species and difference among the wet lands [1,2,3].

Among the commercially important molluscs, the back water clams are one of the most important shell fish along the coast of India. Large quantities of this clam are collected for food and for its use as bait. The bivalves are in general best adopted to lower tidal levels and to firmer deposits. As will be seen, larger numbers of bivalves have been recorded from the seaward fringe of the managers [4,5,6,7].

2. MATERIALS AND METHODS

Study Area

In order to understand the biomass of bivalves fauna and enlist the molluscan population among the coastal wetlands. The following coastal wetlands, Pichavaram, Poombukar, Karaikal and Nagappattinam.

Study Period

The survey and data collection on the population of molluscan forms were conducted between August 2011 to December 2011.

Collection of Bivalves fauna

Molluscan forms were generally found in the mud flats on the shore areas of sea and estuary extensive survey were conducted in the low tidal areas of seashore by walk and shells were collected. The collected shells were brought to the laboratory, cleaned and preserved in 5% formalin later they were identified up to species level by using the identification manuals of Apte (1998)[8].

The animals were collected in each area and later, they were counted and measured in the laboratory to get the numerical and quantitative values. The flesh samples were taken from each station and dried in the oven. The dried samples were taken from each in the mafful furnes. The each sample was measured in the Anamod Electronic Balance.

Identification of Bivalves

The bivalves are identified mainly based on the shell morphology. The shell comprises of two

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values. If the valves are similar, the shell is said to be equivalue (Clammussels): if dissimilar, ineqivalve (Scallops). The outer surface is usually covered with a periostracum. The two valves held together by an elastic ligament, which leaves a scar on the hinge.

Methods of Collection

For the quantitative analysis, the mangrove molluscs were collected by hand picking in a transect of known area or using a quadrate of known size. At the same time the foulers like mussels and oysters were collected by scrapping those using knives or spatula from a known unit area either using a quadrate. Further the infaunal bivalves were collected by using hand digging methods.

3. RESULTS AND DISCUSSION

Biomass Variations

The variations in animal weight, shell weight, flesh weight, dry weight, ash weight, Ash free dry mass (AFDM) and water weight in different species of bivalves from various wet lands (**Table 1**).

Table 1:Animal weight, shell weight, flesh weight, dry weight Ash weight, Ash free dry mass (AFDM) weight an water weight of different fauna of bivalves fro different wetlands, during August 2011 to December 2011.

S. No	Fauna	Weight of Molluscan fauna	Pichavaram	Pommbukar	karaikal	Nagappattnam
1	*Meretrix casta*	Animal weight	20.520	24.625	14.292	47.28
		Shell weight	16.512	20.243	12.365	40.365
		Flesh weight	4.320	3.825	3.838	4.960
		Dry weight	0.341	0.723	0.334	0.858
		Ash weight	0.033	0.455	0.018	0.372
		AFDM weight	0.975	0.681	0.317	0.730
		water weight	2.961	3.203	1.602	5.061
2	*Meretrix meretrix*	Animal wt.	62.876	35.482	54.722	15.335
		Shell wt.	53.087	30.599	43.355	12.58
		Flesh wt.	7.783	3.916	4.213	3.22
		Dry wt.	2.006	0.642	0.955	0.041
		Ash wt.	0.264	0.155	0.623	0.921
		AFDM wt.	0.984	0.780	0.888	0.635
		water wt.	7.778	3.054	4.581	5.318
3	*Donax cuneatus*	Animal wt	9.785	9.826	8.763	34.220
		Shell wt	8.168	7.789	6.57	25.386
		Flesh wt	3.621	3.586	3.293	4.391
		Dry wt	0.753	0.598	0.602	0.926
		Ash wt	0.074	0.056	0.039	0.843
		AFDM wt	0.689	0.048	0.539	0.85
		Water wt	1.989	1.897	1.736	40.308
4	Pema viridis	Animal wt	38.625	39.463	50.304	27.320
		Shell wt	29.912	30.276	45.687	24.2121
		Flesh wt	6.334	5.250	4.314	6.815
		Dry wt	0.936	0.672	0.456	0.513
		Ash wt	0.075	0.81	0.351	0.686
		AFDM wt	0.820	0.932	0.837	0.785
		Water wt	3.960	3.894	4.041	50.206
5	*Phaphina textile*	Animal wt	42.368	29.185	22.472	54.362
		Shell wt	37.621	24.354	18.300	50.280
		Flesh wt	5.473	3.712	5.121	6.912
		Dry wt	0.271	0.635	0.623	0.967
		Ash wt	0.038	0.044	0.72	0.483
		AFDM wt	0.915	0.772	0.844	0.861
		Water wt	4.633	5.340	3.105	7.415

Meretrix casta

The animal weight of *Meretrix casta* was maxim weight 47.28 gm in Nagapattinam and minimum 14.262 gm in Karaikal. The shell weight ranged from 12.365 gm (Karaikal) to 40.365 gm (Nagappattinam). Flesh weight was maximum 4.960 gm (Nagappattinam) and minimum was 3.825 gm (Poombukar). Dry Weight were ranged from 0.334 gm (Karaikal) and 0.858 gm (Nagappattinam) Ash Weight ranged from 0.018 gm (Karaikal) and 0.45 gm (Poombukar). Ash Free Dry Mass ranged from 0.317 gm (Karaikal) to 0.975 gm (Pichavaram). The water weight ranged from 1.602 gm (Karaikal) and 5.061 gm (Nagapattinam).

Meretrix meretrix

The animal of *Meretrix meretrix* animal weight was highest in 62.876 gm (Pichavaram) and lowest in 15.334 gm (Nagapattinam). Shell weight was lowest in 12.582 gm (Nagapattinam) and highest in 53.087 gm (Pichavaram). Flesh weight ranged from 3.221 gm (Nagapattinam) and 7.783 gm (Pichavaram). Dry weight was lowest in 0.044 gm (Nagapattinam) and highest value is 2.006 gm (Pichavaram). Ash weight was highest in 0.92 (Nagapattinam) and lowest in 0.155 gm

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(Poombukar). Ash Free Dry Mass (AFDM) weight was maximum in 0.981 gm (Pichavaram) and minimum in 0.635 gm (Nagapattinam). The water weight was highest in 7.778 gm (Pichavaram) and lowest in 3.054 gm (Poombukar).

Donax cuneatus

The animal weight varied from 8.763 gm (Karaikal) to 34.220 gm (Nagapattinam).The shell weight varied from 6.578 gm (Karaikal) and 25.386 gm (Nagapattinam). Flesh weight was minimum in 3.293 gm (Karaikal) and maximum in 4.391 gm (Nagapattinam). Dry weight was highest in 0.926 gm (Nagapattinam) and lowest in 0.598 gm (Poombukar). The ash weight was minimum in 0.039 gm (Karaikal) and maximum in 0.843 gm (Nagapattinam). AFDM weight was maximum in 0.857 gm (Nagapattinam) and minimum in 0.048 (Poombukar). The water weight was higher in 4.308 gm (Nagapattinam) and lowest in 1.736 gm (Karaikal).

Perna viridis

The animal weight of *Perna viridis* ranged from 27.320 gm (Nagapattinam) and 5.304 gm (Karaikal). Shell weight varied from 24.121 gm (Nagapattinam) and 45.687 gm (Karaikal). Flesh weight was highest in 6.815 gm (Nagapattinam) and lowest in 4.314 gm (Karaikal). Dry weight was maximum in 0.936 gm (Pichavaram) and minimum in 0.456 gm (Karaikal). The Ash weight was lowest value in 0.351 gm (Karaikal) and highest in 0.686 gm (Nagapattinam). AFDM weight was highest in 0.932 gm (Poombukar) and lowest in 0.785 gm (Nagapattinam). The water weight was maximum in 5.20 gm (Nagapattinam) and minimum in 3.894 gm (Poombukar).

Phaphia textile

The animal and shell weight of *Phaphia textile* was maximum vale varied from 54.362 gm and 50.280 gm in Nagapattinam and lowest value varied from 22.472 gm and 18.330 gm in Karaikal region. The flesh weight was highest in 6.912 gm (Nagapattinam) lowest in 3.712 (Poombukar). The dry weight ranged from 0.27 gm (Pichavaram) and 0.967 gm (Nagapattinam). Ash weight was highest in 0.483 gm (Nagapattinam) and lowest in 0.038 gm (Pichavaram). AFDM weight was ranged from 0.772 gm (Poombukar) and 0.915 gm (Pichavaram). The water weight was maximum in 7.415 gm (Nagapattinam) and minimum in 3.105 gm (Karaikal).

Nagarajan (2000)[9] found that all size classes of mussels (*Mytilus edulis*) lost at free dry mass (AFDM) during winter, but to different extends, 60% for 20-30 mm, 58% for 30-40 mm and 13% 60 – 70 mm. The loss of flesh content was therefore highest among the changes in flesh weight of a given size of bivalve result from the dynamic balance between the strange and utilization of food reserves in relation to the complex interactions of foods availability and temperate with growth and reproductive processes. This process differs considerably between bivalves of different age and thus sizes [10].

The flesh content of mollusks also varies seasonally as a result of the seasonality in phytoplankton abundance, which declines throughout the winter [11]. The moll scan fauna of bivalves variations, density, size, distribution, energy allocation and tissue growth at different wet lands was reported [12]. In order to verify whether the mussels are variables associated with biomass estimation such as, animal weight, shell weight, flesh weight, dry weight, AFDM weight and water weight have been variations among the species of wetlands at east least in India.

The 52 different species of bivalves were collected from 4 different wetlands. These bivalves belonged to 3 different family of 5 different species among the 5 species of the *Meretrix meretrix* was highest ranges in animal weight and shell weight were observed from Pichavaram wetland during the study period.

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