

SPATIAL DISTRIBUTION OF BIVALVES IN RELATION TO ENVIRONMENTAL PARAMETERS IN THE LAGOON AREA OF SETIU WETLAND, TERENGGANU, MALAYSIA

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INTRODUCTION

South China Sea waters recorded about 802 species of molluscs [4]. Bivalves are molluscs that consist of two calcified valves joined by elastic ligament (e.g. cockle, mussel and clam)

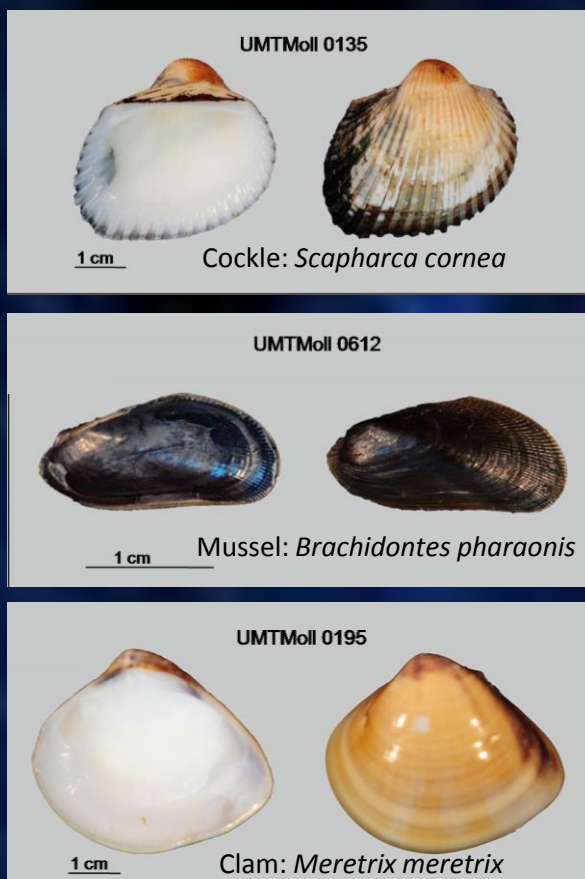
Distributions of bivalves are affected by spatial and temporal differences in environmental conditions such as temperature, salinity, food availability, sediment composition and current pattern [7].

In Malaysia, [9] stated that there were 37 families with 206 species of bivalves have been recorded.

Setiu Wetland had divided into 9 inter-connected ecosystems (e.g. sea, beach, mudflat, lagoon, estuary, islands, river, mangrove forest and coastal forest) from Kg. Penarik to Kg. Beting Lintang [5].

Bivalves are exploited by local communities in Setiu Wetland, however lack of studies had been done on the distribution of bivalves which the data collected will be crucial for biodiversity conservation and sustainable management purposes.

Therefore, this study was done to determine the spatial distribution of bivalve in relation to the environmental parameters in the lagoon area of Setiu Wetland, Terengganu.



SAMPLING LOCATION

Sampling was conducted on two months interval for a year which was in July, September, November 2011 and January, March, May 2012.

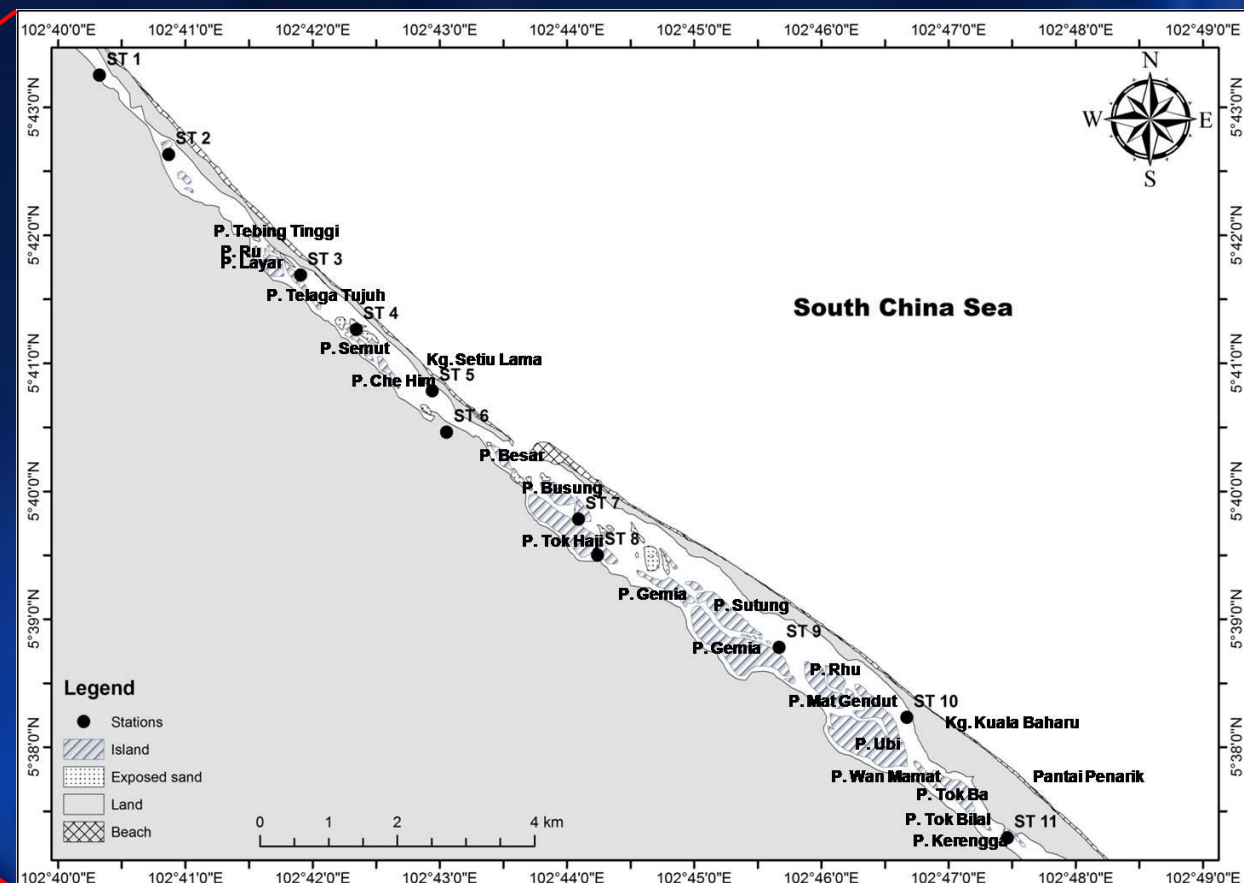
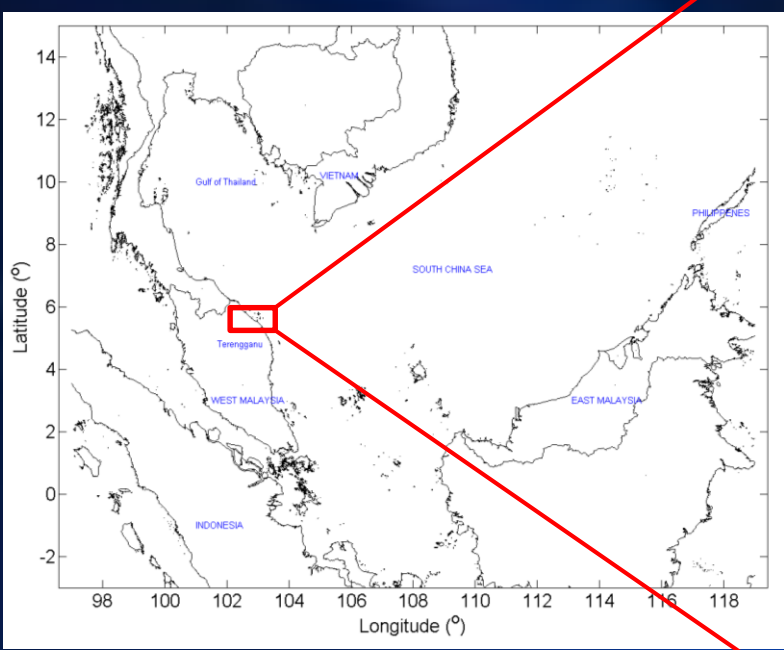
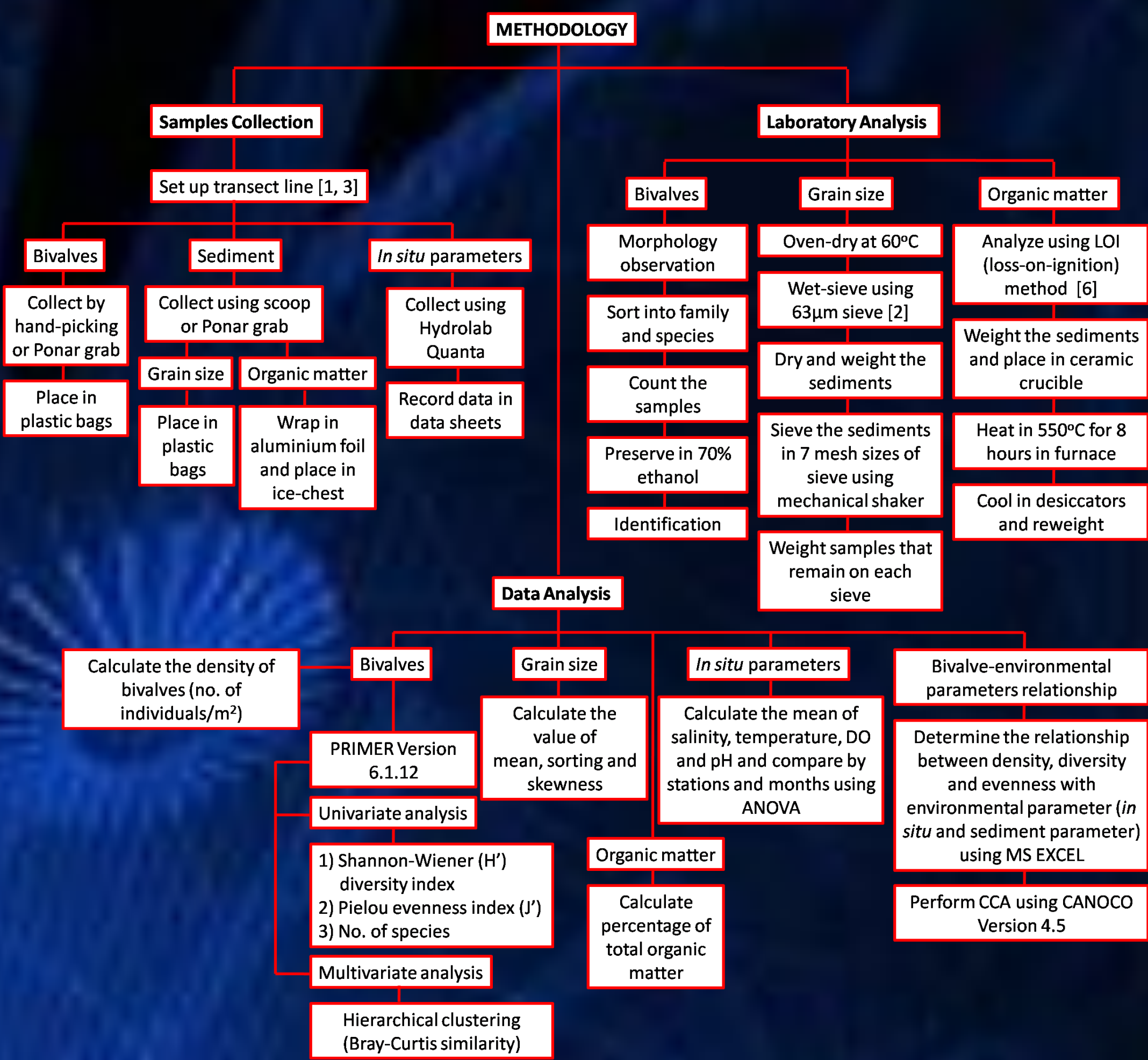


Figure 1: Study area of samples collection in the lagoon area of Setiu Wetland, Terengganu.

METHODOLOGY



RESULTS AND DISCUSSION

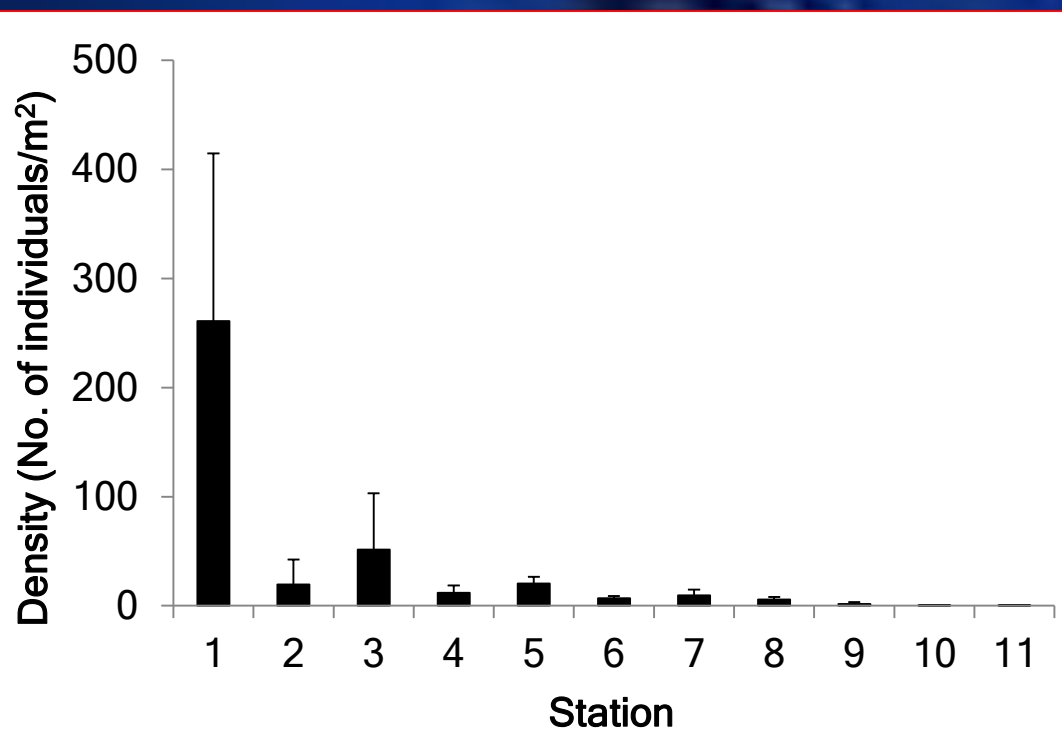


Figure 2: Density of bivalves in the lagoon area of Setiu Wetland, Terengganu.

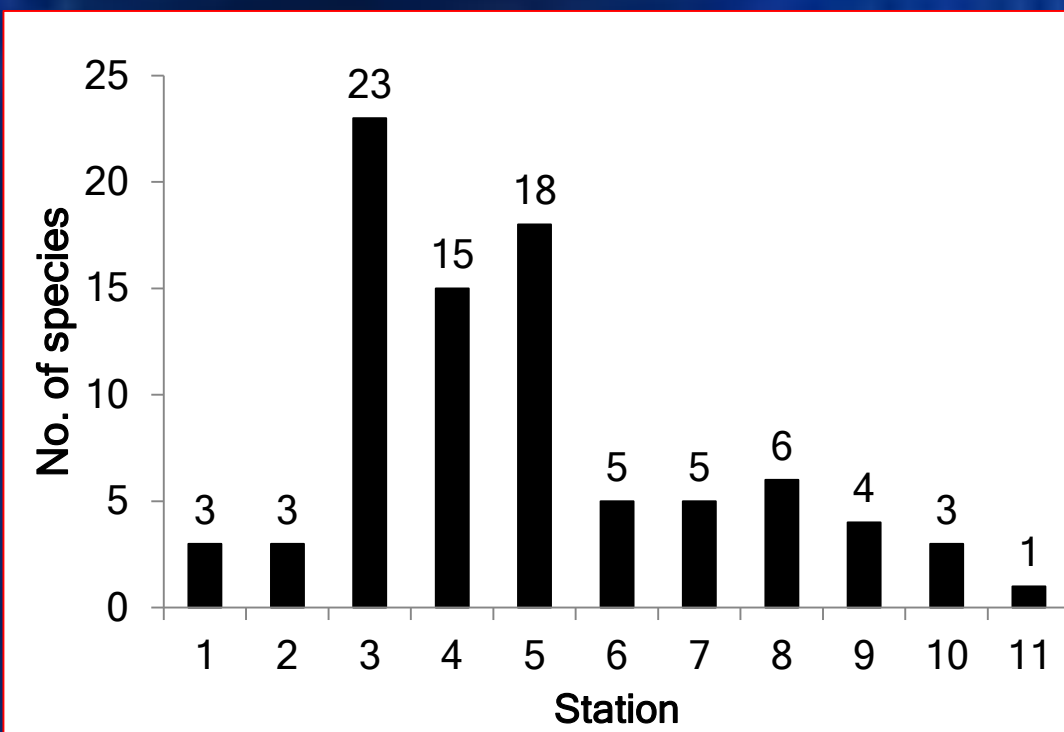


Figure 3: Number of species in the lagoon area of Setiu Wetland, Terengganu.

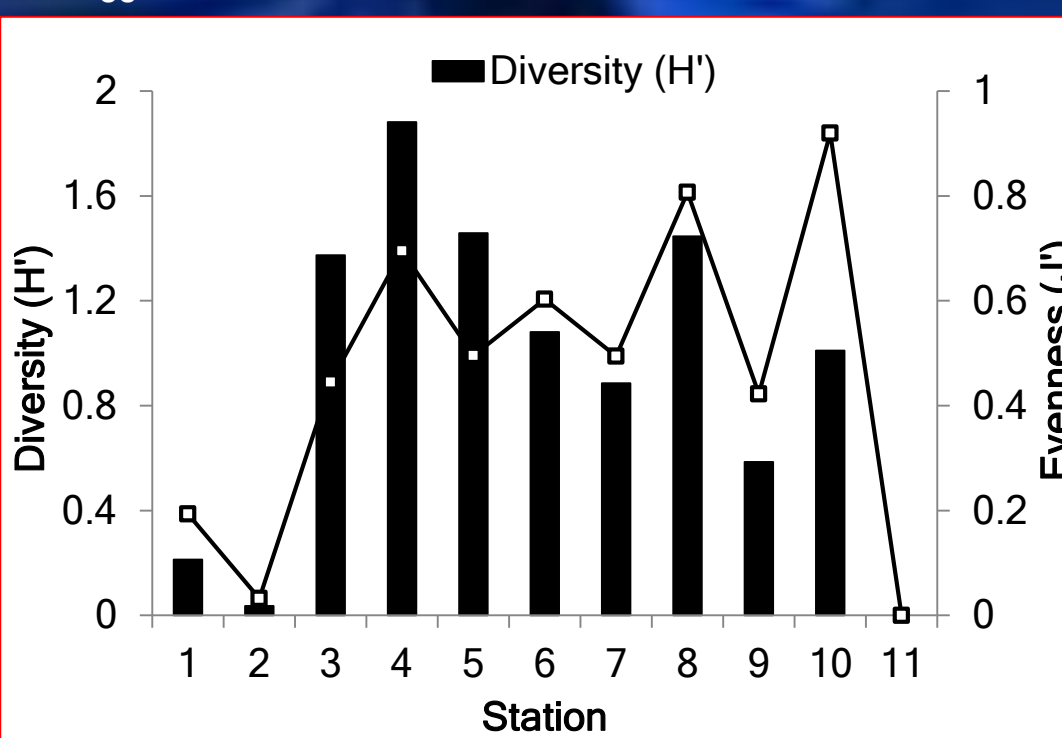


Figure 4: Diversity and evenness index in the lagoon area of Setiu Wetland, Terengganu.

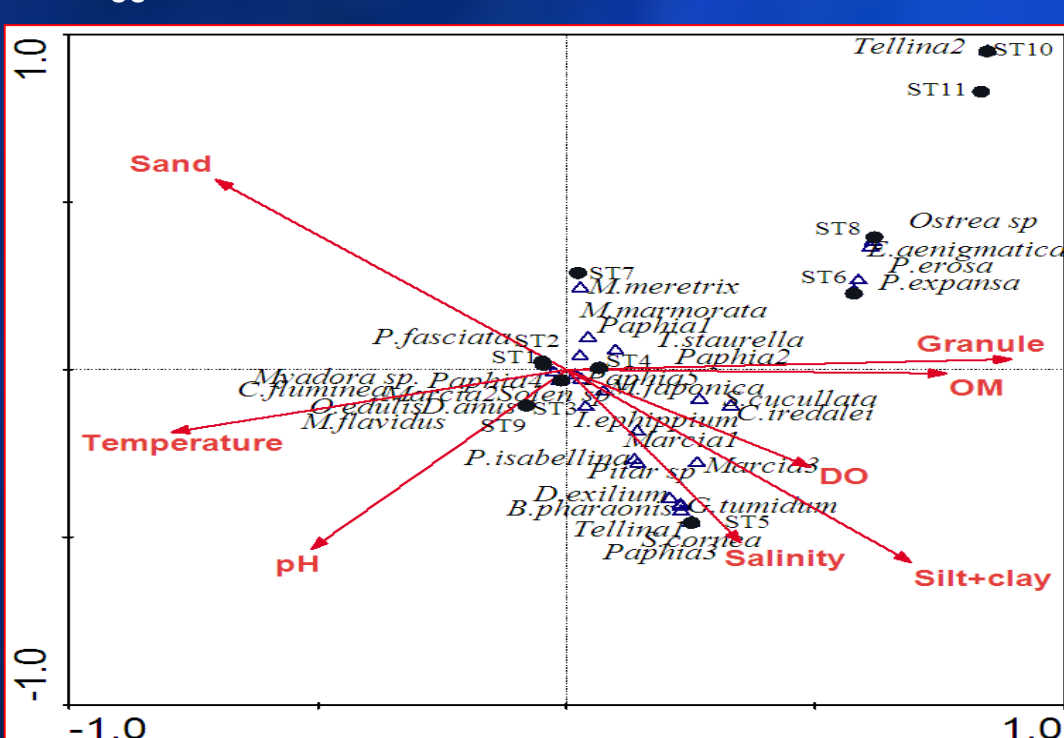


Figure 5: Similarity of bivalves in the lagoon area of Setiu Wetland, Terengganu.

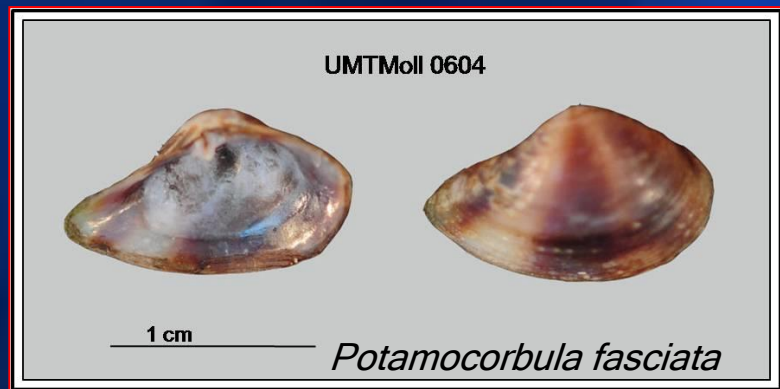


Figure 6: The most abundance species in the lagoon area of Setiu Wetland, Terengganu

BIODIVERSITY OF BIVALVES

A total of 10,845 individual of bivalves were collected and classified into 11 families, 21 genera and 34 species with mean total density of 33 ± 17 individuals/m² (Figure 2, Figure 3).

St. 1 (261 ± 154 individuals/m²) had significantly higher compared to other stations ($p < 0.05$) due to contribution of *Potamocorbula fasciata* (Figure 6) as this species has the ability to tolerate environmental changes such as fluctuations in salinity and anoxia [10] that reflected in the abundance reaching up to thousands per m².

Potamocorbula fasciata contributed 77% from the total abundance of bivalves collected in the lagoon area of Setiu Wetland. This species was not listed in the previous studies in Malaysia.

The lowest mean density of bivalves were at St. 10 and St. 11 (< 1 individuals/m²) which was located in the freshwater subtidal area. This might be due to the high current velocity as the stations were influenced by the river flow from Chalok River and Setiu River. The high current velocity might affect the bivalves' larvae settlement as they might be washed away.

Only 9 species were similar in Malaysia record while the other 24 species were not listed in the recent collection in Malaysia. This might be due to less expertise on bivalves taxonomist in Malaysia and limited studies was conducted at the east coast of Peninsular Malaysia.

The diversity and evenness of bivalves had no significant difference among stations ($p > 0.05$).

BIVALVES - ENVIRONMENTAL PARAMETERS RELATIONSHIP

The density, diversity and evenness of bivalves had no significant correlation with percentage of granule, sand, silt, clay and TOM ($p > 0.01$).

In CCA analysis, the environmental variables were shown in arrows whereby the length of the arrows indicates the relative importance and the directions which were obtained from the correlation of the variable to the axes.

The bivalves species were group based on the area they present and the environmental parameters that affected the species and areas.

The areas that affected by environmental parameters were mainly in the brackish subtidal whereas freshwater subtidal and mangrove intertidal area were not significantly affected by environmental parameters.

CONCLUSION

The density and diversity of bivalves were higher in the brackish subtidal area compared to freshwater subtidal and mangrove intertidal area.

The mean density of bivalves was significantly higher at St. 1 since the station was dominated by *Potamocorbula fasciata*, a species with high environment toleration.

The density of bivalves had significant difference among stations.

Only salinity had strong correlation with diversity. Other parameters had low correlations.

The species of bivalve collected in the lagoon area of Setiu Wetland were about 15% from the number of bivalve species recorded in Malaysia.

Even though the number of collection were not high, it can be concluded that Setiu Wetland had high diversity of bivalves within the limited area.

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