Survey on the diversity of benthic macrofauna in seagrass bed, Middle Bank, Penang, Straits of Malacca

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ABSTRACT

Seagrasses would be one of the most productive aquatic ecosystems in coastal areas where it provides shelter and food for a wide range of species. Malaysia lying within the global biodiversity hotspot is considered to have high species diversity. However seagrass bed along the northern Straits of Malacca is poorly understood due to high sedimentation, which causes the water to be turbid on this side of the peninsular Malaysia. To fill up the knowledge gap, a survey was carried out to describe the diversity of benthic macro fauna from a seagrass bed. Samples were collected using a core sampler and also from the sediment surface at Middle Bank, north Straits of Malacca. A total of 71 species from 6 phyla was collected. Highest species rich group were Mollusca (52 species), Arthropodo (7 species) and Echinodermata (5 species). 71.15% of all the molluscs recorded were gastropods, and family Nassarridae and Potamididae dominated the assemblage with respect to abundance. Genus *Nassarius* and *Cerithiidae* were the two dominant gastropods found in the seagrass bed. Bivalves were represented by only 15 species from 13 genera of the samples, with *Modiolus nitidus*, *Atrina pectinata*, and *Meretrix* sp. being the most dominant species among all the bivalves. Compared to other studies locally and regionally, the diversity of benthic macrofauna in the current survey area was low. However long term monitoring for species diversity is crucial for a sustainable development of marine resources in a seagrass bad.

OBJECTIVES

This study aims to investigate:

- The diversity of seagrass at Middle Bank
- The diversity of benthic macrofauna at Middle bank

METHOD

The survey method that were used in this study was random transect throughout the seagrass bed. Samples were collected from the surface of the sediment/seagrass and also using a core sampler, along with that in situ photograph were taken of live organisms at field. Upon arriving at laboratory, for gastropod and bivalve, the visceral mass was removed; the shells were cleaned; photographs were taken for identification purpose; and transferred into 70% alcohol fixation and preservation. As for soft-bodied organisms, samples were relaxed in menthol crystal for photography and preservation. The entire sample were labelled and deposited at Centre for Marine and Coastal Studies (CEMACS), USM.

STUDY SITE

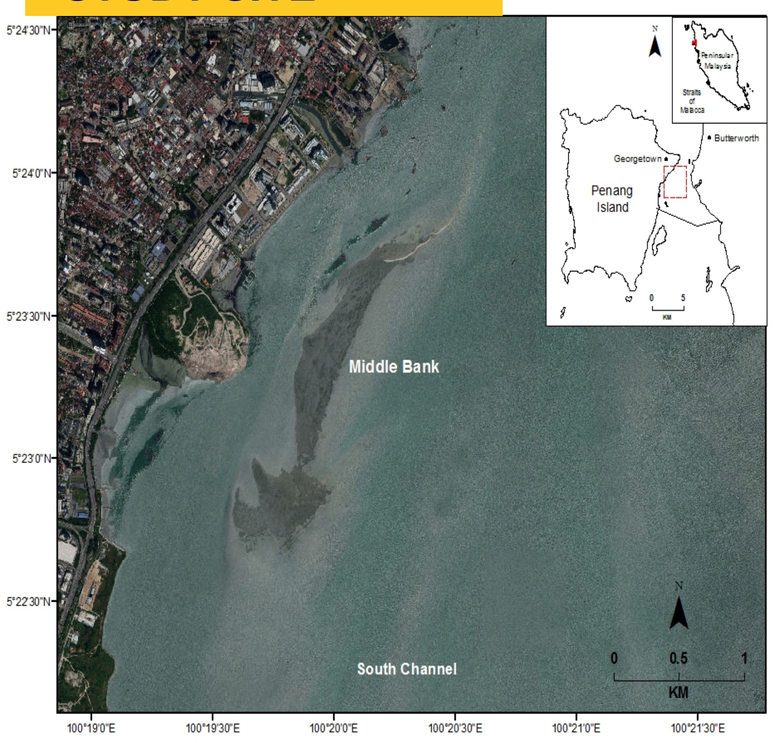
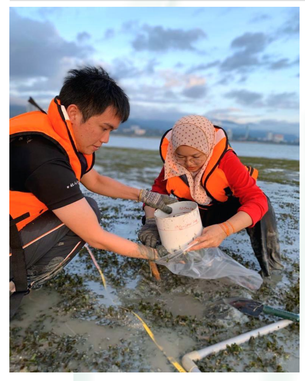


Figure 1. Location of the study site.

Middle bank lies along the south channel of east coast of Penang Island, where it is shallow, exposed during low tide and also a seagrass bed (Figure 1). It is precisely situated between 5°36'N - 5°40'N and 100°33'E - 100°34'E, strecting for about ~3 km.



RESULTS & DISCUSSION

Based on the survey, 3 species of seagrass were identified at Middle Bank, which are *Halophila ovalis* (Figure 2), *Halophila spinuosa,* and *Enhalus acoroides* (Figure 3). The dominant species were *H. ovalis*, and *E. acoroides*. *H.spinulosa* were only spotted seasonally in small patches along the seagrass bed.

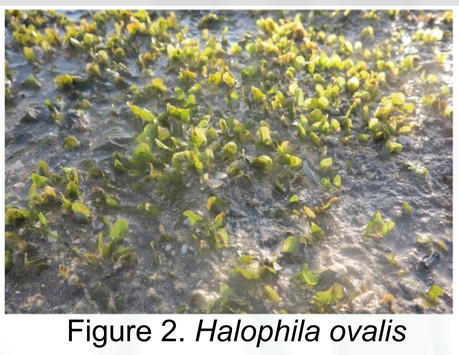


Figure 2. *Halophila ovalis*

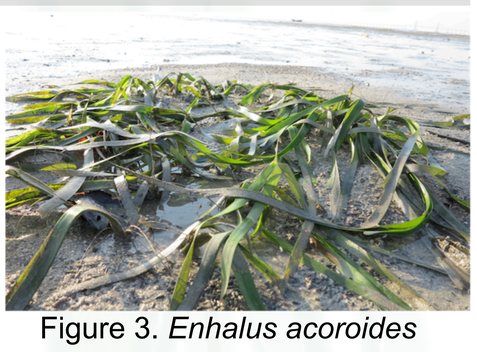


Figure 3. *Enhalus acoroides*

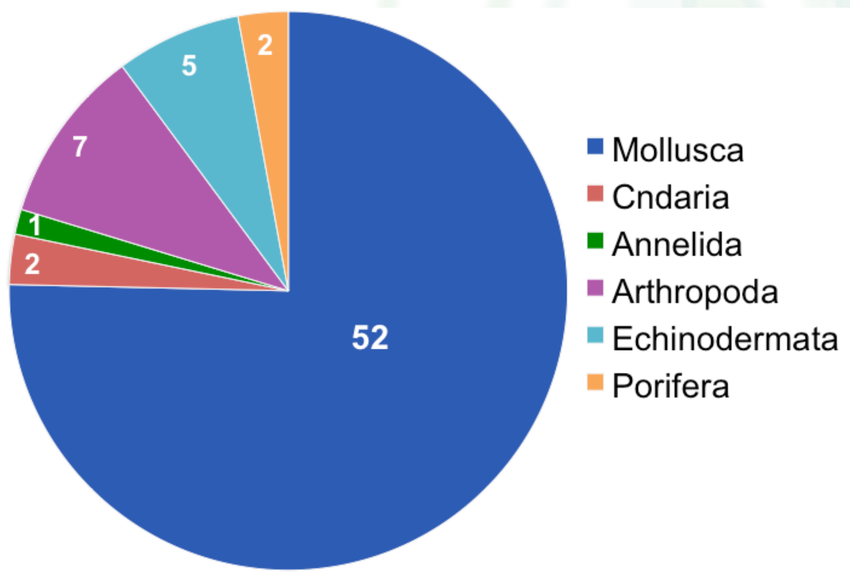


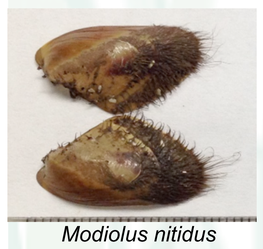
Figure 4. Diversity of benthic macrofauna

Dominant species


Atrina pectinata


Nassarius livescens


Cerithium coralium


Modiolus nitidus


Murex trapa


Marginellidae sp.


Phyllophorus sp.


Stichodactyla gigantea


Holothuria leucospilota


Porifera (Unknown)


Echinodiscus sp.


Decapoda (Unknown)

Polychaeta (Unknown)

- 71.15% of Molluscs comprises of gastropods;
  Genus *Nassarius* and *Cerithiidae* were the two dominant gastropods
- A total of 15 species from 13 genera of Bivalve were observed;
  Modiolus nitidus, *Atrina pectinata*, and *Meretrix* sp. being the most dominant species
- *Stichodactyla gigantea*, a species of sea anemone were found abundantly
- A total of 5 species from 5 family from Echinodermata were recorded
- 7 possible species of Arthropoda were collected, identification still in progress
- This area has been proposed to be protected as anthropogenic stressors such as coastal development, land reclamation, destructive fishing and pollution could amplify due to poor management and cause destruction.

CONCLUSION

Not all species has been discovered and identified, hence there is still a need for more sample collection to better understand the diversity of macrobenthos in Middle bank seagrass bed. However, this checklist would be necessary to improve our knowledge on the diversity of benthic macrofauna in seagrass bed on the northern Straits of Malacca. A long term monitoring on the species diversity is also essential for a sustainable development of marine resources in a seagrass bad.

ACKNOWLEDGEMENT

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