MEIOBENTHOS OF MALACCA STRAITS AND USE OF N/C RATIO AS BIOLOGICAL INDICATOR FOR COASTAL POLLUTION

B.A.G. Idris, M. Kusnan, Z. Kassim and A. Ismail

Faculty of Sciences and Environmental Studies
Universiti Putra Malaysia, 43400 UPM, Serdang, Selangor,
Malaysia

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Introduction

Meiobenthos is a microcospic invertebrate with body size of less than 1 mm, lives in bottom sediments of fresh water and marine habitats. Twenty-two out of 33 metazoan phyla are represented in meiobenthos taxa. Meiobenthos can be found in any type of sediment, from muddy sediment to rough sand and gravel. Certain taxon can be found on seagrasses, seaweeds and amongst corals. Some meiobenthos adapt to life in the sediment as a mesobenthic or interstitial organism. Due to its benthic nature and a very short life cycle, it was found recently that meiobenthos is a very reliable and good biological indicator for detection of coastal pollution (Higgins and Theil 1988; Subramanium et al.1988). In Malaysia, there are very little studies on subtidal meiobenthos. Studies by Idris et al. (1994a, 1994b) revolved around intertidal area only. The studies on meiobenthos in Asia especially in subtidal area are very rare except for some studies in Japan and China, and in the Indian Ocean.

Materials and Methods

The sampling was carried out at six stations along two transects lines in subtidal areas in the Straits of Malacca. Box corer with size of 20X30X50 cm was used to sample the sediments. Sediment samples were then sliced with thickness of about 2 cm each. For each slice, three replicates of sub-samples were taken using hand corer of 2.2 cm in diameter (3.7994 cm^2). The samples were preserved in 5% of neutralised formaline with rose Bengal added. In the laboratory the preserved samples were elutriased by using modified Boisseau Apparatus and were sieved using 1 mm dan 42 μm mesh sizes nets. Sediment samples and meiobenthos which were caught in the 42 μm net were washed into the petri dishes and were decanted through sieves six to eight times. The meiobenthos samples were then sorted and counted us-

ing binocular dissecting microscope. All meiobenthos taxa were identified using guide from Higgins and Theil (1988).

Results and Discussion

Nine taxa of meiobenthos were recorded from subtidal areas of the Malacca Straits, namely Foraminifera, Ostracoda Polychaeta, Nematoda, Copepoda, Tardigrada, Oligochaeta, Kinorhyncha, and Cumacea. The mean density of meiobenthos in the subtidal areas of the Malacca Straits was 332.2±83.5 individual/10cm2. Among all the taxa, it was found that the most dominant taxon was Foraminifera with a mean density of 220.7±65.6/10cm2 or 66.43%, followed by Nematoda (41.3±12.8/10cm or 12.44%), Ostracoda (31.8±8.9/10cm2 or 9.58%) and Polychaeta (20.8±6.9/10cm2 or 10.54%). Foraminifera were the most dominant taxon at all stations and depth, while Tardigrada, Cumacea and Kinorhyncha were present but in low density. The study on vertical distribution of meiobenthos taxa and its density in subtidal areas of the Malacca Straits showed that all taxa of meiobenthos stayed at the top 6 cm of the sediment layer and reduced rapidly with increase in depth. In term of density it was found that 83.65 % of meiobenthos density accumulated in the first 6 cm of the sediment layers. Only two taxa survived up to 20 cm of the sediment layers, that is Foraminifera and Ostracoda.

Conclusions

Meiobenthos may be used as a bioindicator of organic pollution.

References

Higgins, R.P., and Thiel, H. 1988. In: *Introduction to the study of Meiofauna.* Smithsonian Institute Press, Washington D.C. p.11-33.

Idris, A.G., Bani Amin, B. and Khairul Azman, Y. 1994a. Meiofauna in Three Types of Sediments in Port Dickson Area and use of N:C ratio in determinants of Coastal Pollution. International Conference on Applied Ecology and Biology of Benthic Organisms, Malaysia. p. 32.

Idris, A.G., Misri, K. and Mokhtar, D. 1994b. Meiobenthos in Seagrass Area of Sibu Island. International Conference on Applied Ecology and Biology of Benthic Organisms, Malaysia. p. 16.

Subramanian, V., Jha, P.K., Van-Grieken, R. and Bett, B. 1988. Monitoring with meiofauna. *Mar. Pollut. Bull.* 19: 293-295.