

Some notes on macrobenthos in estuaries with an emphasis on macrobenthic community structure of Negombo estuary.

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Abstract

Benthos are the organisms which are attached to or resting on the bottom or living in the bottom sediments. They play an important role in aquatic ecosystems. Benthic animals have been identified as good indicators of environmental conditions of aquatic ecosystems. The present study was undertaken to study the spatial variation of macrobenthic community in Negombo estuary, which is subjected to variety of anthropogenic activities. Benthic samples from 25 sampling sites to cover the entire lagoon were obtained in March 2003 and the macrobenthos were separated by wet sieving and identified as much as possible. Seventy-six species of benthic invertebrates belonging to 41 families were recorded during the present study. Of these, only 11 species could be identified to the genus level and 47 species were identified to the family level. Eighteen species could not be identified even to the family level due to unavailability of suitable keys. The results indicated that there is a need to carry out an indepth taxonomic study on benthic invertebrates in brackish water environments in Sri Lanka. Such a study will significantly contribute to enhance the existing knowledge on biological diversity in aquatic ecosystems in Sri Lanka.

Introduction

Benthic organisms and their ecological significance

Benthos, which are the organisms attached to or resting on the bottom or living in the bottom sediments (Odum, 1971) can be divided into 3 groups on the basis of their size. These are the Microbenthos (animals which pass through a 40-60 mm sieve), Meiobenthos (animals which are retained by a 40-60 mm sieve and pass through a 500 mm sieve) and Macrobenthos (animals which are retained by a 500 mm sieve) (McLusky, 1971). Most macrobenthos are invertebrates. The most important groups of freshwater and brackish water macrobenthos include some crustaceans, mollusks, worms, insects and insect larvae (Samarakoon & Van Zon, 1991). The amphipods (Class: Crustacea) are an important constituent of macrobenthos of the inner areas of estuaries, and are normally found associated with the finer sediments. Other major groups of benthic invertebrates of estuaries are the

polychaetes (Phylum: Annelida) bivalves and gastropods (Phylum: Molluska). A wide range of sediment choice is exhibited by the polychaetes (Perkins, 1974).

Benthic macrofauna play an important role in aquatic ecosystems. In the aquatic food webs, they can either be primary or secondary consumers with diversified feeding habits and act as grazers, omnivores, carnivores and bacteriovores. Benthic invertebrates, specially benthic worms, are very important as a food resource for a large number of predators such as benthic fish and some aquatic insects, and as primary material exchangers across sediment water interface (Bouguenec & Gaini, 1989).

Environmental factors and the benthic community structure

Survival, distribution and abundance of the macrobenthos depend on the characteristics of their environment. Benthic community structure in brackish waters depends on environmental factors such as salinity, organic matter content, soil texture, sediment particles and the ability of constructing permanent burrows in sand etc. Different macrobenthic communities are associated with different qualities of the sediment. Since most of the macrobenthos are detritivores, the amount of organic matter in the sediment also affects their community structure. Therefore, any form of anthropogenic input which increases the organic matter content in the sediment may also decide the community composition of the macrobenthos in aquatic environments (Perkins, 1974).

Aquatic vegetation favours the occurrence of benthic macro-invertebrates. The seagrass beds in estuaries are highly productive and provide nursery areas for many macrobenthic invertebrates such as crustaceans, polychaetes and mollusks (Samarakoon & Van Zon, 1991). Mangrove and associated ecosystems with muddy substrates and associated creeks, puddles and small water holes, offer many habitats for a wide variety of benthic invertebrates. The benthic invertebrates that have been found in mangrove areas include barnacles, sponges, polychaete worms, gastropods, bivalves, isopods, amphipods, mysids, crabs, shrimps, copepods, ostracods, coelenterates, nematodes, brachyzoans, tunicates and an array of insects (Odum *et al.*, 1982).

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