

Influence of some environmental factors on the abundance of three commercially important bivalve species (Family: Veneridae) in the Puttalam Lagoon and Dutch Bay, Sri Lanka.

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Abstract

Water temperature, salinity, seagrass coverage, organic matter content in the soil and soil texture play an important role in the distribution of bivalves. The present study was carried out to determine whether these parameters significantly affect the abundance of three commercially important bivalve species viz. *Gafrarium tumidum*, *Marcia hiantina* and *Marcia opima* in the Puttalam lagoon and Dutch bay. The abundance of these bivalves in the Puttalam lagoon and Dutch Bay was found to be significantly correlated with salinity ($r = -0.57$, $p < 0.05$), seagrass coverage ($r = 0.89$, $p < 0.001$), organic matter content in the soil ($r = 0.91$, $p < 0.001$) and soil texture. It was also found that the organic matter content in the sampling sites were highly correlated with the seagrass coverage ($r = 0.90$, $p < 0.001$). Therefore, it is evident that the seagrass cover significantly affects the abundance of bivalves in the Puttalam lagoon and Dutch bay probably through enhancing the deposition of bivalve larvae, inhibiting the borrowing activity of predators and increasing the productivity via increasing the organic matter content in the soil, and deposition of sediments. As such it appears that, in resource management, the conservation of seagrass beds should get high priority and thus the operation of fishing gear that are harmful to seagrass beds, such as push nets and drag nets has to be minimized.

Introduction

Clams and cockles are bivalve molluscs that live in soft or sandy mud in the intertidal and subtidal zones in estuaries and bays. They are considered as a good source of protein and are harvested from the natural environment and are cultured in many countries around the world.

The distribution pattern of many marine invertebrates including bivalves is based on the success of spawning, larval movements, metamorphosis and spat survival (Quayle & Bourne 1972). Bivalves occur in a variety of aquatic habitats and some species of family Veneridae including *Gafrarium tumidum*, *Marcia hiantina* and *Marcia opima* can be found throughout the Asia-Pacific region. In Sri Lanka, *G. tumidum* is widely distributed in the littoral and sub-littoral regions of coastal areas and is found in