

ABSTRACT

The objective of the present study was to investigate the distribution, population dynamics and the fishery of three bivalve species, viz, *Gafrarium tumidum*, *Marcia hiantina* and *Marcia opima* in Dutch Bay and Puttalam lagoon, Sri Lanka, in order to identify means of sustainable exploitation of these resources.

The relative abundance of bivalves in Dutch Bay (range 21.75-41.83/m²) was found to be higher than in Puttalam lagoon (range 0-20.43/m²), and their distribution was positively correlated to sand and organic matter contents in the soil and to seagrass density.

Growth of the three bivalve species was better in Dutch Bay than in Puttalam lagoon possibly due to favourable environmental conditions prevailing in Dutch Bay. This was evaluated using growth performance (ϕ') calculated from asymptotic length and growth constant which were estimated using ELEFAN technique. For the three species ϕ' ranged from 3.19 to 3.48 in Dutch Bay and from 3.18 to 3.40 in Puttalam lagoon.

In Dutch Bay, the two bivalve species *M. hiantina* and *M. opima* which registered low densities were heavily exploited, as opposed to the most abundant species *G. tumidum* which was least exploited. Exploitation rates of *G. tumidum*, *M. hiantina* and *M. opima* were 0.30, 0.83, 0.73, respectively.

Recruitment seasonalities in the three bivalve populations in Puttalam lagoon indicated the occurrence of two recruitment pulses while a single recruitment pulse occurred for each of the three species in Dutch Bay. As such the three bivalves species in Puttalam lagoon exhibit features of "r - selected" life strategies as opposed to the populations of Dutch bay which seem to be "K- selected" ones. This reveals that the three bivalve species occurring in Dutch Bay where conditions are favourable for them can support small-scale fisheries due to the presence of sizable populations.

The estimated mean annual yield from the fishery during 1992 - 1993 was 1151 mt (with shell). *G. tumidum* accounted for 88.5% of the catch and *M. hiantina* and *M. opima* were 9.7% and 1.8%, respectively. The bivalve fishery is useful in resource management of marine fisheries as it helps to control the fishing pressure on finfish stocks in the marine environment.