

ABSTRACT: BIONOMICS OF MUD CRAB FISHERY IN THE  
NEGOMBO LAGOON

A B S T R A C T

Mud crab Scylla serrata is a commercially important species in the Negombo Lagoon. In the recent past the demand for crabs increased rapidly due to export as well as high acceptance in the local market. This resulted in rapid but hap-hazard exploitation of the resource endangering its existence in the lagoon. Thus, a necessity arose to introduce management practices to utilize the resource efficiently without overexploiting the species. In the light of this need a study was carried out to understand the biology and fishery of the Scylla serrata in the Negombo Lagoon.

The study was commenced in February, 1985 and was continued till December 1987.

The hydrobiological parameters were studied in five stations of the lagoon by collecting monthly water samples. The taxonomic features, food and feeding habits and the reproductive biology was studied by analyzing samples representing crabs of all sizes.

Carapace length was measured from market stocks at weekly intervals. The length data were analysed performing the ELEFAN II as implemented in Complot ELEFAN in order to estimate growth parameters.

Attempts were also made to study the larval and juvenile populations by sampling with plankton and dip nets respectively.

The aspects related to the fishery was studied collecting information from fishermen and their spouses who live around the lagoon.

The salinity of the lagoon varied between 0-35 ppt. High saline waters were found near the mouth. The salinity variation was dependant on the rainfall. The water temperature ranged between 22°C - 34°C.

Turbidity in the lagoon was low during the latter years of the study. The pH in the lagoon water averaged within a short range (5 - 9). Rainfall was high in the catchment area with two rainy seasons a year.

The taxonomic status of Scylla serrata was confirmed by the characteristics: smooth granular carapace, 22 spines, and the well adapted chela. The colour of crabs was found to be environment dependant.

Large crabs mainly fed on mollusc whilst the small ones preferred crustaceans. No seasonal variation was observed in food items. The crabs feed continuously during the night and at the high tide in the daytime.

The asymptotic length was estimated to be 22.4 cm for both males and females. The  $\phi'$  value obtained for the species was 5.7.

The estimated mortalities and exploitation rate indicates an over exploitation of the species. The

length at first capture and the size at first maturity further indicate an over exploitation of the immature population.

Length weight relationship show a good fit to the allometric growth equations with males and females showing no significant difference from a common formula.

The stage at first maturity was 12 cm in female crabs. The pre-spawning fecundity was estimated to be around 2 - 4 million. The post-spawning fecundity was around 1.5 million. The ova matures at the size of about 300  $\mu$ m. The ova are found in three batches indicating partial spawning behaviour. Spawning takes place in two seasons April and August. The sex ratio was even in most size group, in most months of the year.

The attempts made to study the larval population was not successful. Juvenile crabs ranged between 2.7 - 7.0 cm. Their habitat was shallow areas in the lagoon. Juveniles occur in bulk during February/March and August/December.

Baited trap was the main gear used to catch crabs. Crabs also get caught as by-catches in drag net, dip net. Brush park also land crabs of small sizes.

Around 100 fishermen engaged in the fishery of which approximately 25% totally dependant on crab fishery alone for their living. Around 8 - 24 people daily engage in crabbing.

The catch varies with the season showing peaks in November and December. The crab landings comprise crabs of even 5 cm. Approximately 80% of the exploited stocks are less than 15 cm in carapace length.

The price of a big crab (>15 cm in carapace length) is around Rs. 17.00. A Kg of meaty crabs is worth about 3 us\$.

Catch per unit effort was showing a declining tendency over the three years of study.