

FISHERY AND SOME ASPECTS OF BIOLOGY OF
Penaeus indicus (H. Milne Edwards)
WITH NOTES ON CO-OCCURRING PENAEID SPECIES
IN THE WEST COAST OF SRI LANKA

BY

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ABSTRACT

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The fishery and some aspects of biology of Penaeus indicus in the west coast of Sri Lanka were studied in Negombo and Chilaw areas from January 1979 to January 1981. The catch, effort, species composition, recruitment, mortality, survival rates, morphometrics, maturity stages, growth, fecundity, spawning seasons and by-catch were investigated for commercially important Penaeid prawns with Penaeus indicus being selected for detailed study.

In this study, for convenience, the prawns were categorised under two groups, namely small prawns consisting of Metapenaeus dobsoni, Parapenaeopsis stylifera, Metapenaeus ensis, Parapenaeopsis cornuta, and Paleomonid sp. and large prawns consisting of Penaeus indicus, Penaeus monodon, Penaeus semisulcatus, and Penaeus merguensis. Of the small prawns M. dobsoni and P. stylifera are the most dominant in the fishery, while P. indicus is the most abundant of the commercially important large penaeid prawns. In Negombo the high catches were mainly of small prawns while in Chilaw large prawns of commercial importance constitute considerably in the main catch. P. stylifera were caught throughout the year while P. merguensis showed erratic fluctuations in catches during certain months. The annual prawn production was estimated to be 158,296 kg in Negombo area and 133,053 kg in Chilaw area. The annual maximum sustainable yields estimated for these areas were 177,956 kg and 233,183 kg respectively.

ELEFAN 1 & 11 computer programmes were used to calculate the total mortality, growth rate, survival rate, longevity and L (maximum length) for P. indicus and these show that they are respectively, 4.41 yearly; 1.8 cm. yearly in carapace length; .02 yearly; 1-2 years and 5.652 cm. carapace length. Using Pauly's equation the natural mortality, fishing mortality and the exploitation rate for P. indicus were calculated and they were found to be 3.041 yr⁻¹, 1.37 yr⁻¹ and 0.31 respectively.

Six maturity stages of the ovary of P. indicus were recognised. Its fecundity ranged from 50,000 to 700,000.

The length increment per moult of P. indicus was found to be 2.71 mm. in total length. The sex ratio for these species approximated to 1:1. Spawning of P. indicus takes place from August to February and recruitment occurs during April - May and September - October.

Shrimp by-catch ratio was found to be approximately 2:1 in Negombo and 1:1 in Chilaw. The by-catch consisted of 40 species of bony fishes belonging to 13 families. The annual shrimp by-catch was estimated to be 69,076 kg. in Negombo area and 156,219 kg. in Chilaw area.

The results are been discussed in relation to the existing fishery in the respective areas of study.