

AN ASSESSMENT OF THE PRAWN FISHERY OF THE SEA-WARD
REACHES OF THE HOOGLHY ESTUARY*

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ABSTRACT

The prawn fishery of the sea-ward reaches of the Hooghly estuary (West Bengal, India) which was of the magnitude of about 619, 555 and 515 tonnes in 1967, 68 and 69 respectively and comprised mostly of the species *Parapenaeopsis sculptilis*, *Palaemon tenuipes*, *Metapenaeus brevicornis*, *Aceles indicus*, *Palaemon styliferus* and *Penaeus indicus* contribute almost half of the total prawn landings from the Hooghly-Matlah Estuarine System. Data so far gathered on the fishery biology of these prawns are reviewed and discussed, indicating trends in the development of capture fishery (for prawns) at the river mouth region, generally termed as the marine zone of the estuary. The possibilities of expanding prawn culture practices in the area are also discussed.

INTRODUCTION

THE fauna of any typical estuarine system, in general, is composed of marine elements which get in for either feeding or breeding purposes, freshwater organisms which go down into the brackishwater and adopt themselves to different degrees of salinity and the truly resident species. The Hooghly estuary, which is the major component of the Hooghly-Matlah Estuarine System in West Bengal State, India, is characteristic in this respect and shows a complexity of environmental and biological features, with violent mixing of tidal and freshwater influxes during certain seasons. Information so far gathered on the biology of this estuarine system clearly indicates that among the fauna present, the marine species are the dominant and most important (Gopalakrishnan, 1969). Among these, the fishes and crustaceans have been the most successful, forming important commercial fisheries.

The East/Coast of India produces about 9.5 thousand tonnes of crustaceans, forming about 6 per cent of the total fish landings of the area (Panikkar, 1967). However, this is only about 20 per cent of the total marine prawn catches in the country (Jones, 1968). Being the major estuary on this coast, the Hooghly-Matlah System has an important role in the future development of the shrimp fisheries of the upper region of the Bay of Bengal. The present account, therefore, aims to focus attention towards the possibilities for development of culture and capture prawn fisheries in the region.

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PRODUCTION OF PRAWNS

The total estimated landings of fishes and prawns in the entire Hooghly-Matlah Estuarine System as well as the lower zone above, for the years 1967, '68 and '69, are given in Table 1. The prawn landings from the lower zone during earlier years were (Rao, 1969) : 1962-63, 586 t; 1963-64, 542 t; 1964-65, 737 t and 1965-66, 538 t. From these data it will be seen that the prawn catches from this

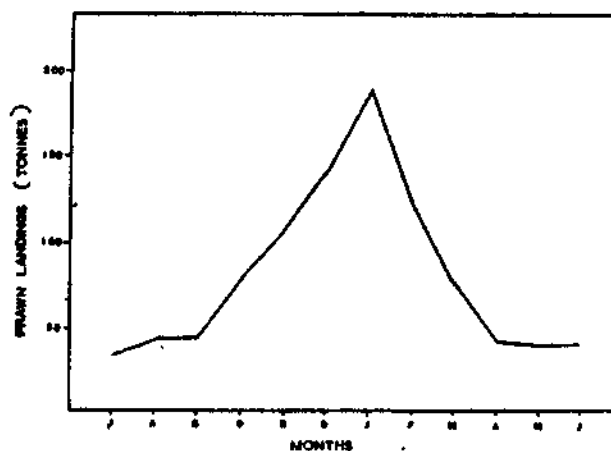


Fig. 1. Mean monthly prawn catches from the lower zone of the Hooghly-Matlah estuarine system.

region have been more or less constant during the past few years, with minor annual fluctuations. However, when considering the percentage of prawns in the total catches from the zone, there appears to be a downward trend, the earlier values being : 1962-63, 15.12; 1963-64, 10.20; 1964-65, 7.76 and 1965-66, 10.17 per cent. This perhaps is due to increased exploitation of fin-fishes and suggests the scope for augmenting prawn catches.

TABLE 1. Estimated landings of fin-fish and prawns from the entire Hooghly-Matlah Estuarine System and from the lower zone (ses-ward reaches) of Hooghly river.

Year	Landings from the entire system (tonnes)			Landings from lower zone of Hooghly (tonnes)			
	Total	Fin-fish	Prawns	Total	Fin-fish	Prawns	% of prawns
1967	7,839	6,790	1,049	5,813	5,194	619	11.9
1968	8,054	6,860	1,194	5,823	5,268	555	9.5
1969	8,343	7,232	1,111	6,156	5,641	515	8.4

The mean monthly prawn catches from the lower zone of the estuary, as derived from the data for the entire period mentioned above, is plotted in Fig. 1,

from which it will be observed that the peak period is during the winter season (December to February). This is quite understandable, as about 75 to 80 percent of the total yearly catches are made during the winter season, when a large number of fishermen migrate to the region and set up temporary fishing camps.

SPECIES COMPOSITION

From the data gathered during recent years as well as those already published (Rao, 1969), it is evident that the sea-ward reaches of the Hooghly estuary is the most important source for prawns in the whole system. The more important species contributing to the landings are mentioned below, in the order of their abundance:

Species	% in prawn landings
<i>Parapenaeopsis sculptilis</i>	32.5
<i>Palaemon tenuipes</i>	27.7
<i>Metapenaeus brevicornis</i>	23.2
<i>Acetes indicus</i>	6.1
<i>Palaemon styliferus</i>	5.2
<i>Penaeus indicus</i>	2.5

Juveniles of *Penaeus monodon* have been found to be abundant at certain centres in the transient zone of the estuarine system, but they do not occur, in significant numbers, in the commercial catches. Adults however, occur in the 'Bheris' (brackishwater impoundments) in the lower zone of the estuary Sunderbans).

FISHERY BIOLOGY

The fishery biology of some of the important species of prawns occurring in the sea-ward reaches of the Hooghly estuary has been studied by workers at the Central Inland Fisheries Research Institute, Barrackpore, and the salient features of the findings, which are of interest in the present context, are mentioned below.

Parapenaeopsis sculptilis (Heller)

The investigations of Rajyalakshmi (1964) have shown that the males and females of the species grow at a rapid rate during the earlier months. The rate of growth, however, declines by the end of the I year and then maintains a constant proportion during later years. The females appear to grow at a slightly faster rate and live upto III years.

Palaemon tenuipes (Henderson)

Rajyalakshmi's studies (1964) have indicated that the growth of this species is rather slow and that the breeding season is prolonged. It has also been observed from the samples available for her study, that only 0 - and 2 - year groups are present in the commercial catches. Very few individuals of this species appear to remain to reach II year growth.

Metapenaeus brevicornis (H. Milne-Edwards)

In the lower zone of the Hooghly estuary, the I and III year classes of this species contribute to the fishery during practically all the months of the year and the 0 year group appears only during July to December (Rajyalakshmi, 1961). The

growth in females appears to be faster than in males during the second year. The spawning periods of the species are March-April and June-July, the breeding area being the seaward reaches of the estuary or inshore areas. Rajyalakshmi had reasons to think that the young ones either migrate or get pushed up into the estuary by tides.

Palaemon styliferus H. Milne-Edwards

Growth of this species has been found to be more or less same in both the sexes. The prawn grows to 55 and 85 mm by the end of the first and second years. The rate of growth is faster during the second year and the average monthly increases are about 3-4 mm (Kunju, 1955; Rajyalakshmi, 1964). The prawn feeds on debris, crustaceans and fish larvae (Kunju, 1955). The breeding season extends from October to July and the berried females appear to migrate seaward at the time when the eggs begin to hatch.

GENERAL REMARKS

From the observations stated above, it is evident that almost half of the total landings from the Hooghly-Matlah estuarine system are derived from the seaward reaches of the Hooghly river. As is well known, the salinity of an estuary acts as the limiting factor in the distribution of its organisms in the different stages of their life history. In the Hooghly estuary, 15 species of prawns are important from the commercial point of view, but only 6 of them generally frequent the higher salinity regions. The actual immigration of these prawns appears to occur when the salinity in the region increases during the winter and summer seasons.

From the available data on landings it is observed that the prawn catches from the lower zone of the Hooghly estuary have remained more or less stable during the last few years. Hence what is perhaps now required is the use of specially designed prawn gear, since it is felt that the conventional multi-purpose gear now being used may not be able to produce more prawns at the present rate of exploitation.

Preliminary investigations conducted at the Estuarine Division of the Central Inland Fisheries Research Institute have indicated that the Hooghly-Matlah Estuarine System appears to have potential for increased exploitation and intensive development of coastal aquaculture, especially with regard to prawn farming. The seed of the culturable species of prawns have been found to occur in appreciable numbers at different centres on the estuarine system (Gopalakrishnan, 1968). Preliminary studies made at the experimental Brackishwater fish farm of the Institute, located at Kakdwip in Sunderbans, have shown that the culture of penaeid prawns in the region has great possibilities. *Penaeus indicus*, *P. monodon*, *Metapenaeus monoceros*, and *M. brevicornis* of average length 84, 30, 48 and 35 mm respectively, have been found to grow to 144, 83, 84 and 89 mm respectively in 90 days, at a total stocking density of 2,00,000/ha. However, detailed investigations in this direction would be necessary before commercial prawn farming could be taken up on a large scale. Concentrated attempts to produce prawn seed by artificial breeding are also required to be made. Learning from the experience of Japan, where the techniques of rearing *P. japonicus* have been developed successfully during the past 10 years, it would be advisable to pay special attention on the rearing of post-larvae, increasing survival rates in rearing ponds and evolving reasonably cheap foods for the prawns. The Sunderbans region of the Hooghly-Matlah Estuarine System has the ability to support a much better prawn industry concerning both capture and culture fisheries.

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