

## CHANGE IN SPECIES COMPOSITION OF PRAWNS IN THE TRAWL FISHERY AT MANDAPAM

### ABSTRACT

Prawns form an important constituent of the trawl catches at Mandapam. By and large the green tiger prawn *Penaeus semisulcatus* de Haan, is one of the important species contributing to the prawn fishery. In recent years significant change in the pattern of species composition has been observed and is dealt with.

THE SYSTEMATIC exploratory surveys to assess the fishery potential of the offshore regions of the Gulf of Mannar, undertaken by the Exploratory Fisheries Project and Integrated Fisheries Project have revealed some productive fishing areas for fish and prawns (Rao, 1968 ; Rao and Dorairaj, 1969 ; James and Adolf, 1969). Prawns form an important constituent of the trawl landings at Mandapam on the southeast coast of India. The green tiger prawn *Penaeus semisulcatus* de Haan is the major species contributing to the prawn fishery at Mandapam. Thomas (1974, 1975) has studied the biological aspects of *P. semisulcatus* at Mandapam. In a study of the prawn fishery of the centre during 1973-79, the landings and species composition of prawns showed some changes in the percentage composition of different species. This was studied in detail and reported here.

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The mechanised trawlers operating off Mandapam were of medium sized vessels, 9.14 - 9.75 m in length with engines of horse power between 36 and 48 H.P. The fishing operations were carried out in nights using otter trawl. The trawlers operated mostly in Palk Bay (Devipattinam and Thondi) at 9-13 m depth zones except during November-March when some of the boats operated in the Gulf of Mannar side.

Prawns of the family penaeidae contributed to the fishery of Mandapam and it was pre-

dominated by *Penaeus semisulcatus* throughout the year. The species *Metapenaeus affinis* was next in abundance with peak landings during January-June. During 1973-75 the percentage of *P. semisulcatus* varied between 88.0 to 91.0, which increased to 98.0 and 99.0 during 1976-77. *M. affinis* formed the rest of the prawn catch in all these years. Other species such as *P. indicus*, *P. merguensis*, *P. monodon*, *P. canaliculatus*, *Parapenaeopsis uneta*, *P. stylifera*, *P. maxillipedo*, *P. tenella*, *Metapenaeopsis stridulans* and *Trachypenaeus pescadoreensis* occurred sporadically. During 1978 the percentage of *P. semisulcatus* was 89.6 and that of *M. affinis* 8.0%. On an average in 1973-78 *P. semisulcatus* was the dominant species, contributing to more than 87.0% of the annual prawn landings at Mandapam. But during 1979 considerable change in the composition of the species was noticed. *P. semisulcatus* contributed to 55.1% while *M. affinis*, the percentage of which ranged between 1.1 and 12.5 during 1973-78, increased to 40.3% in the prawn catch with peak season during January-June (Table 1). *P. merguensis* which occurred rarely formed 2.4% in 1978 and 1.4% in 1979 in the prawn catch. The occurrence of *M. stridulans* and *T. pescadoreensis* contributing 3.2% of the prawn catch was another notable feature of the fishery in 1979. Thus it is very clearly seen that the pattern of species composition has changed significantly in 1978-79 (Table 1).

Studies on *cpue* and percentage of *P. semisulcatus* and *M. affinis*, the two most important species which contribute to the prawn fishery at Mandapam for the period 1973-79 revealed

that the *cpue* of *P. semisulcatus* at 24.2 kg in 1973 decreased to 21.5 kg in 1974. Rising to 26.1 kg in 1975, there was a declining trend in the *cpue* of this species thereafter, reaching the lowest level in 1979 (8.6 kg). The *cpue* of *M. affinis* below 3.4 kg in 1973 to 1978 increased to 6.4 kg in 1979. Monthly percentage occurrence of the different species showed that *M. affinis* exceeded more than that of *P. semisulcatus* in the months of March (60.0%), April (76.0%) and May (58.1%) during 1979.

entrants into the fishery. The probable reason for the decline in the representation of *P. semisulcatus* may be the commencement of Thalluvalai fishery from 1976, fishing out juveniles of this species in large numbers from their nursery grounds, the inshore waters of Palk Bay between Mudiveeranpattinam and Thondi. The Thalluvalai fishery is being carried out by dragging a bag net (length 14.65 m, height 5.0 m at the head and 0.71 m at the cod end) of mesh size 3 cm from a dug out canoe with sail. The prawn catch consists of mostly juveniles of *P. semisulcatus* of size

TABLE 1. Details on catch (in tonnes), catch per unit effort (in kg) and percentage of different species of prawns during 1973-79

|   | 1973  | 1974  | 1975  | 1976  | 1977  | 1978  | 1979  |
|---|-------|-------|-------|-------|-------|-------|-------|
| <i>Penaeus semisulcatus</i>   |       |       |       |       |       |       |       |
| Catch   | 257.1 | 219.9 | 348.5 | 343.8 | 193.8 | 246.6 | 218.5 |
| Cpue  | 24.2  | 21.5  | 26.1  | 16.3  | 12.2  | 13.2  | 8.6   |
| Percentage  | 87.7  | 86.6  | 90.9  | 98.9  | 98.1  | 89.6  | 55.1  |
| <i>Metapenaeus affinis</i>  |       |       |       |       |       |       |       |
| Catch   | 36.1  | 31.3  | 34.8  | 3.8   | 3.9   | 22.0  | 159.6 |
| Cpue  | 3.4   | 3.1   | 2.6   | 0.2   | 0.2   | 1.2   | 6.3   |
| Percentage  | 12.3  | 12.5  | 9.1   | 1.1   | 2.0   | 8.0   | 40.3  |
| <i>Penaeus merguensis</i>   |       |       |       |       |       |       |       |
| Catch   | —     | —     | —     | —     | —     | 6.5   | 5.4   |
| Cpue  | —     | —     | —     | —     | —     | 0.4   | 0.2   |
| Percentage  | —     | —     | —     | —     | —     | 2.4   | 1.4   |
| <i>Metapenaeopsis stridulans</i> and<br><i>Trachypenaeus pescadoreensis</i> |       |       |       |       |       |       |       |
| Catch   | —     | —     | —     | —     | —     | —     | 12.6  |
| Cpue  | —     | —     | —     | —     | —     | —     | 0.5   |
| Percentage  | —     | —     | —     | —     | —     | —     | 3.2   |

It is quite evident from the above that there is some change in the species representation in the fishery. *P. semisulcatus* which was dominant in earlier years has gone down, increasing the representation of *M. affinis* and also bringing in species like *P. merguensis*, *M. stridulans* and *T. pescadoreensis* as new

range 5-9 cm. The higher percentage of *M. affinis* and appearance of other species in the prawn catch in 1978-79 may be in accordance with the principles of ecology in which when a particular species decreases in the population, the related species increase (Watt, 1968 ; Odum, 1970).

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