

ON THE GILL-NET FISHERY OF *PENAEUS INDICUS* H. MILNE EDWARDS ALONG TUTICORIN COAST

ABSTRACT

The gill-net fishery of *Penaeus indicus* H. Milne Edwards along Tuticorin coast was seasonal extending for a period of five to eight months. During the period 1990 - '92 the estimated annual landing of this species ranged from 7.7 to 25.0 tonnes. Prawns in the size range of 118 to 143 mm in total length dominated the fishery. Sexes were more or less equally distributed and the proportion of mature females formed a significant proportion from June to August.

THE WHITE prawn *Penaeus indicus* H. Milne Edwards is widely distributed in the Indo-Pacific waters and is one of the most important species of commercial importance in the Gulf of Mannar (Mohamed, 1969; Motoh, 1980; Manissery and Manimaran, 1981). This species supports an active seasonal fishery along the South-east coast of Tamil Nadu during certain parts of the year (Rajamani and Manickaraja, 1990). The present paper reports on the fishery of *P. indicus* along Tuticorin coast based on the observations made on the catches landed by gill-nets at Tuticorin North Landing Centre during the three year period from 1990 to 1992.

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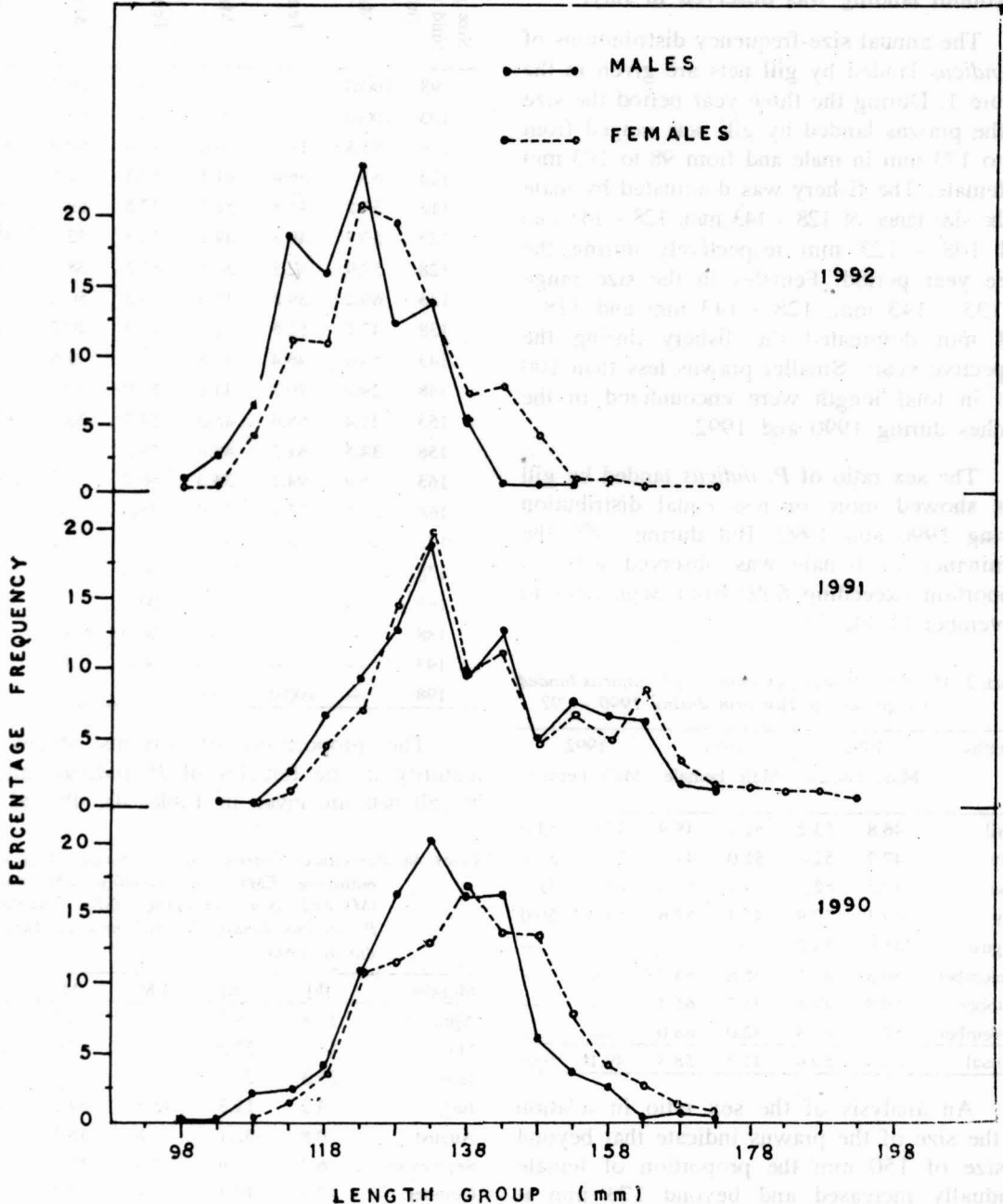
The North Landing Centre of Tuticorin, where the prawns captured by gill-nets were landed, was visited weekly once and data on catch and effort were collected. The prawns were landed normally in the afternoon. The craft used for the fishing was plankbuilt boat with in-board motor and the gear used was prawn gillnet with a mesh size of 40 mm (Joel and Ebenezer, 1985). During each observation a sample of 50 individuals were measured and the gonadal conditions were noted in the landing centre itself. The methods described by Rao (1967) were followed for the classification of the gonadal maturity conditions.

TABLE 1. Estimated catch (kg), effort (units) and catch rate (kg/unit) of *P. indicus* landed by gillnets at Tuticorin during 1990-'92

Months	1990			1991			1992		
	Effort	Catch	Catch rate	Effort	Catch	Catch rate	Effort	Catch	Catch rate
April	1,085	6,679	6.4	120	246	2.1	1,200	2,352	2.0
May	1,640	9,616	5.9	180	513	2.9	231	308	1.3
June	900	2,550	2.8	456	3,564	7.8	312	744	2.4
July	130	1,001	7.7	1,820	8,785	4.8	1,170	3,575	3.1
August	294	1,326	4.5	No fishing			150	750	5.0
September	552	1,488	2.7	325	1,025	3.2	No fishing		
October	304	1,168	3.8	350	651	1.9	No fishing		
November	152	836	5.5	224	1,976	8.8	No fishing		
Total	5,057	24,964	4.9	3,475	16,760	4.8	3,063	7,729	2.5

The estimated landings of *P. indicus* by gill nets during the year 1990 - '92 are given in Table 1. The catch showed a declining trend from 25.0 t in 1990 to 16.8 t in 1991 and

then sharply declined to 7.7 t in 1992. The catch rate also showed a similar decreasing trend from 4.9kg during 1990 to 4.8kg during 1991 and then to 2.5kg during 1992. It was



1. Annual size-frequency distributions of *P. indicus* landed by gill-nets at Tuticorin North Landing Centre during the period 1990—'92.

observed that the month of maximum landing of the prawn varied from year to year. During 1990 the maximum landing was recorded in May. But during the subsequent two years the maximum landing was observed in July.

The annual size-frequency distributions of *P. indicus* landed by gill nets are given in the Figure 1. During the three year period the size of the prawns landed by gill nets ranged from 98 to 173 mm in male and from 98 to 193 mm in female. The fishery was dominated by male in the size range of 128 - 143 mm, 128 - 143 mm and 108 - 123 mm respectively during the three year period. Females in the size range of 133 - 143 mm, 128 - 143 mm and 118 - 128 mm dominated the fishery during the respective years. Smaller prawns less than 100 mm in total length were encountered in the catches during 1990 and 1992.

The sex ratio of *P. indicus* landed by gill nets showed more or less equal distribution during 1990 and 1992. But during 1991 the dominance of female was observed with its proportion exceeding 60% from September to November (Table 2).

TABLE 2. Monthly sex-wise percentage of *P. indicus* landed by gillnets at Tuticorin during 1990 - '92

Months	1990		1991		1992	
	Male	Female	Male	Female	Male	Female
April	46.8	53.2	51.1	48.9	47.0	53.0
May	47.2	52.8	51.0	49.0	50.0	50.0
June	37.3	62.7	44.1	55.9	49.0	51.0
July	49.1	50.9	42.4	57.6	50.0	50.0
August	45.5	54.5	—	—	—	—
September	59.3	40.7	35.6	64.4	—	—
October	50.9	49.1	34.7	65.3	—	—
November	52.7	47.3	32.0	68.0	—	—
Annual	49.4	50.6	41.7	58.3	49.1	50.9

An analysis of the sex ratio in relation to the size of the prawns indicate that beyond a size of 150 mm the proportion of female gradually increased and beyond 173 mm it dominated the fishery exclusively (Table 3).

TABLE 3. Sex-wise percentage distribution of *P. indicus* landed by gillnets in different length groups

Size group (mid point) (mm)	1990		1991		1992	
	Male	Female	Male	Female	Male	Female
98	100.0	—	—	—	66.7	33.3
103	100.0	—	100.0	—	85.7	14.3
108	83.3	16.7	50.0	50.0	60.9	39.1
113	63.6	36.4	61.5	38.5	62.1	37.9
118	54.5	45.5	52.5	47.5	59.3	40.7
123	50.7	49.3	49.2	50.8	52.5	47.5
128	57.9	42.1	38.8	61.2	38.0	62.0
133	60.2	39.8	40.4	59.6	50.0	50.0
138	47.5	52.5	41.7	58.3	40.7	59.3
143	53.6	46.4	44.8	55.2	5.6	94.4
148	29.7	70.3	44.1	55.9	10.0	90.0
153	31.4	68.6	45.3	54.7	33.3	66.7
158	38.5	61.5	48.8	51.2	—	100.0
163	5.9	94.1	33.3	66.7	—	100.0
168	25.0	75.0	25.0	75.0	—	—
173	20.0	80.0	30.0	70.0	—	100.0
178	—	—	—	100.0	—	—
183	—	—	—	100.0	—	—
188	—	—	—	100.0	—	—
193	—	—	—	100.0	—	—
198	—	100.0	—	—	—	—

The proportions of various stages of maturity in the females of *P. indicus* landed by gill nets are given in Tables 4a, 4b and 4c.

TABLE 4a. Percentage distribution of immature (IM), early maturing (EM), late maturing (LM) mature (M) and spent-recovering (SP) females of *P. indicus* landed by gill nets at Tuticorin during 1990.

Months	IM	EM	LM	M	SP
April	17.8	36.2	—	12.5	33.5
May	16.3	57.3	—	2.5	23.9
June	25.3	24.7	—	13.7	36.3
July	3.2	11.3	15.5	34.2	35.8
August	0.8	32.1	0.8	16.2	50.1
September	6.2	41.9	7.4	12.1	32.4
October	13.3	18.3	—	0.2	68.2
November	31.0	22.4	—	—	46.6

TABLE 4b. Percentage distribution of immature (IM), early maturing (EM), late maturing (LM) mature (M) and spent-recovering (SP) females of *P. indicus* landed by gill nets at Tuticorin during 1991.

Months	IM	EM	LM	M	SP
April	86.4	4.6	—	—	9.0
May	52.0	32.0	—	—	16.0
June	—	0.1	0.1	61.0	38.8
July	18.4	4.8	7.9	22.3	46.6
August	No fishing				
September	80.8	12.6	—	—	6.6
October	56.3	21.9	—	—	21.3
November	—	—	26.5	41.2	32.3

It can be seen from the Tables that mature female constituted significant proportion from June to August during 1990, in June, July and November in 1991 and in July during 1992. Immature females were observed in the catches during all the months in 1990 and 1992. During 1991 immature females were not represented in the catches landed in June and November. Females in early maturing and spent-recovering stages dominated the catch during 1990.

TABLE 4c. Percentage distribution of immature (IM), early maturing (EM), late maturing (LM) mature (M) and spent-recovering (SP) females of *P. indicus* landed by gill nets at Tuticorin during 1992.

Months	IM	EM	LM	M	SP
April	89.2	—	—	1.2	9.6
May	93.4	—	—	1.1	5.5
June	89.2	8.1	2.7	—	—
July	24.8	1.6	5.6	36.2	31.8
August	No sample				

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The gill net fishery along the South-east coast of Tamil Nadu is seasonal and it is supported almost exclusively by *P. indicus*. The fishermen living in the coastal villages between Tuticorin and Cape Comorin exploit this seasonal resource by operating their gill nets. It has been proved earlier by the investigations carried out by the Central Marine Fisheries Research Institute that the prawns that migrate from the South-west coast of India support the seasonal fishery along the South-west coast of Tamil Nadu (Anon, 1982). According to Rajamani and Manickaraja (1990) the prawns captured from the grounds off Periatthalai near Manapad in the South-east coast of Tamil Nadu during the season from June to August were larger in size as compared to the prawns captured from the ground off Tuticorin during the same season. Further, immature females were seldom represented in the catches landed from the former ground. On the other hand, immature females were observed during most of the months in the catches landed at Tuticorin and also formed a sizeable proportion of the female population.

Thus it appears that the population of *P. indicus* that supports the fishery off Tuticorin belong to a different stock and not to the one that migrates from the South-west coast of India.

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