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OBSERVATION ON THE SEASONAL PRAWN FISHERY OF THE PERIATHALAI COAST IN THE GULF OF MANNAR

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ABSTRACT

The seasonal prawn fishery of Periathalai, a fishing village on the south-east coast of Tamil Nadu, lasts for a period of three to four months in a year. The fishery was constituted exculsively by *Penaeus indicus*. During the three year period from 1985 to 1987 the estimated catch of P. *indicus* ranged between 95.9 and 106.7 tonnes and the maximum catch was recorded in the month of July. There was a gradual decrease in the female population. Mature and spent-recovering females formed major portion whereas immature females were seldom recorded in the catches.

INTRODUCTION

The tagging experiments conducted by the Central Marine Fisheries Research Institute have established that the white prawn, *Penaeus indicus* migrates from the west coast to the east coast and supports a seasonal fishery along the southeast coast of Tamil Nadu during certain part of the year (Anon., 1982). The fishermen in the coastal villages on the south-east coast of Tamil Nadu between Tiruchendur and Cape Comorin carry out prawn fishing by operating gill nets from their catamarans for a short period of three or four months every year from June/July to September/October. Though they are engaged in fishing activities throughout the year their activities are more concentrated during this short period when the prawns, which form the main source of their income are available. In order to study the prospects of the seasonal prawn fishery, regular observations were made at Periathalai, an important fishing village, situated about 70 km south of Tuticorin on the south-east coast of Tamil Nadu, during the years 1985 - '87 and the results are presented here.

COLLECTION OF DATA

Observations at the landing centre were made once a week during 1985 and once in ten days during 1986 and 1987. The craft used in the area was catamaran (Ramamurthy and Muthu, 1969). The gear used was gillnet with a mesh size of 40 mm. A detailed description of the gillnet used in the area has been given by Joel and Ebenezer (1985). By the multi-stage stratified sampling method (Alagaraja, 1984) monthly catch was estimated.

The gillnet catch was constituted by a single species of prawn viz., *P. indicus* with various species of fish as by-catches. On each observation day about 50 individuals of P. *indicus* were analysed in the landing centre itself for total length, weight, sex ratio and maturity stages. Gonadial maturity conditions were classified as immature, early maturing, late maturing, mature and spent-recovering based on the colour and size of the gonads (Rao, 1967).

THE FISHERY

When the weather conditions were favourable, around 400 catamarans, most of

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them fitted with out-board motors were operated daily during the season i.e., from June/July to September/October except on Sundays and first fridays of the months. Four makes of out-board motors viz., Yamaha, Evinrude, Johnson and Mariner were fitted to the crafts. Normally, the fishermen leave the shore early morning. The fishing ground is about 5 km from the shore where the depth ranges from 15 to 20 metres. After the fishing is over most of the catamarans return to the shore either in the afternoon or evening.

Catch statistics

The estimated catch of P. *indicus* landed at Periathalai during the three year period from 1985 to 1987 shows that the catch was more or less steady. From 106.7 tonnes recorded in 1985 the catch decreased to 95.9 tonnes in 1986 and then increased to 104 tonnes in 1987. The average catch per effort was 5.3 kg during 1985 and 1986. However, it increased to 7.9 kg during the subsequent season. The fishery commenced during the month of June in 1985 whereas in 1986 and 1987 it commenced only in July. However, the maximum catch was recorded in July during all the three years (Table 1).

Length-frequency distributions

The length-frequency distributions of both males and females are given in Figure 1. In males the size ranged between 123 and 201 mm and in females between 121 and 217 mm. The fishery was predominantly composed of males in the size of 153 -168 mm and females in the size of 163 -183 mm. Progressive increase in size was recorded from July to September in both the sexes.

Sex ratio

Dominance of one sex or the other was not uniform throughout the period of observation. Females dominated in all the four months in 1985 and in August, 1986 while males dominated, in other months of 1986 and 1987 excepting in July 1987 when both the sexes maintained 1:1 ratio (Table 2). The percentage of females was found to steadily increase beyond the size of 178 mm while males were not represented in the catches beyond 198 mm (Table 3).

Maturity stages

Immature females of *P. indicus* were recorded in the catches only in the month of

TABLE 1. *Estimated catch (kg), effort (units) and catch rate (kg/unit)* o/P. indicus *landed bygillnets at Periathalai during 1985 - '87*

Months	1985			1986			1987		
	Effort	Catch	Catch rate	Effort	Catch	Catch rate	Effort	Catch	Catch rate
June	4,200	15,400	3.7	No fishing			No fishing		
July	6344	44,689	7.0	8,250	84,398	10.3	7,150	67,720	9.5
August	1,125	4,665	4.2	6,000	5,736	1.0	2,080	32,712	15.7
September	8,400	41,994	5.0	3,704	5,800	1.6	3,900	3,654	0.9
Total	20,069	1,06,748	5.3	17,954	95,934	5.3	13,130	1,04,086	7.9

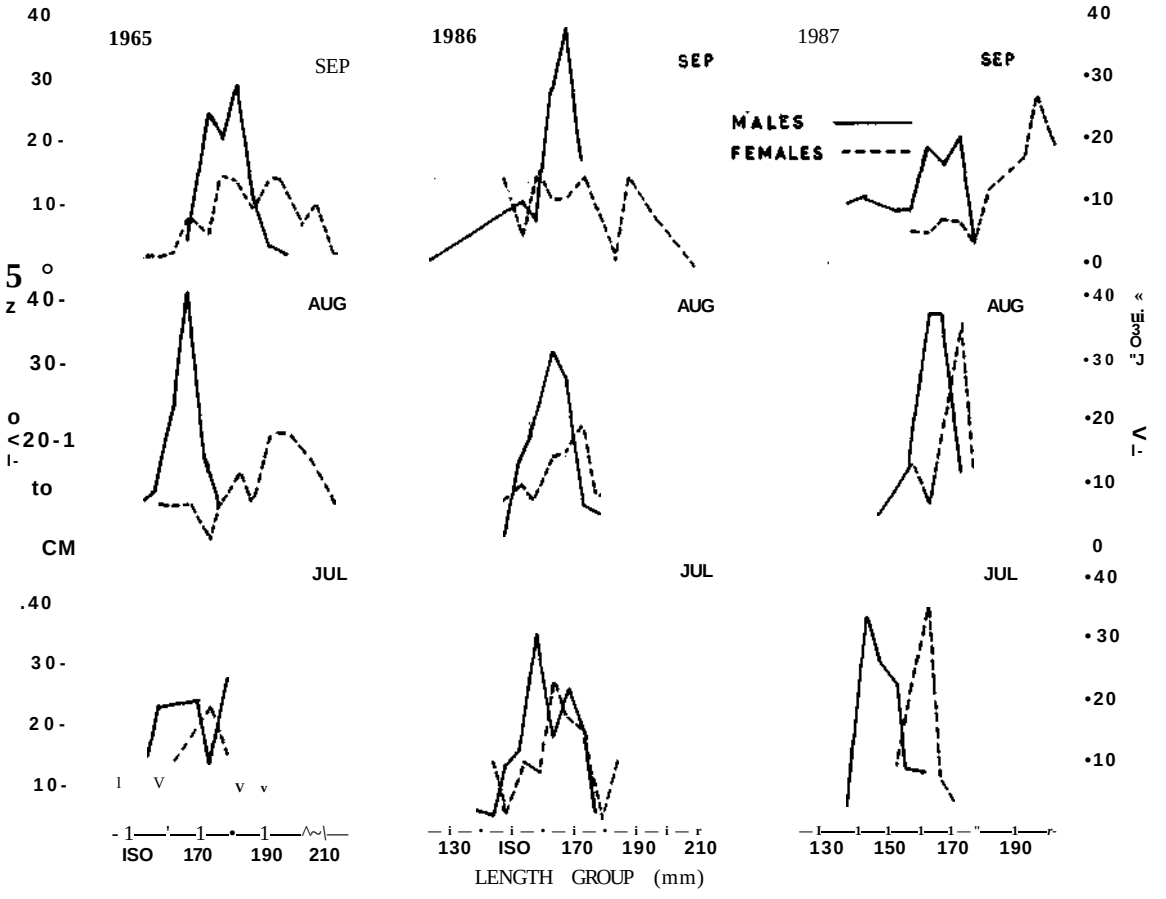

Fig. 1. Length-frequency distribution of P. *indicus* landed at Periathalai village during the years 1985 - '87.

TABLE 2. *Monthly sex-wise percentage of* P. indicus *landed by gillnets at Periathalai during 1985-87*

Months	1985		1986		1987	
	Male	Female	Male	Female	Male	• Female
June	40.7	59.3	—	—	—	—
July	47.1	52.9	51.5	48.5	50.0	50.0
August	46.1	53.9	44.9	55.1	59.5	40.5
September	41.6	58.4	50.7	49.3	56.9	43.1
Average	43.9	56.1	48.0	51.0	55.4	44:6

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

Size group (mid point) (mm)	1985		1986		1987	
	Male	Female	Male	Female	Male	Female
123	—	—	50.0	50.0	—	—
128						
133		100.0	100.0			
138	100.0	—	80.0	20.0	100.0	—
143	14.3	85.7	65.0	35.0	100.0	—
148	64.3	35.7	76.9	23.1	100.0	—
153	53.3	46.7	66.1	33.9	83.3	16.7
158	60.0	40.0	61.4	38.6	60.0	40.0
163	58.3	41.7	65.7	34.3	68.1	31.9
168	43.8	56.2	61.3	38.7	52.4	47.6
173	60.7	39.3	37.5	62.5	52.0	48.0
178	43.8	56.2	20.0	80.0	20.0	80.0
183	45.9	54.1	—	100.0	—	100.0
188	29.7	70.3	—	100.0	—	100.0
193	17.9	82.1	—	100.0	—	100.0
198	5.6	94.4	25.0	75.0	—	100.0
203	—	100.0	—	—	—	100.0
208	—	100.0	—	100.0	—	—
213	—	100.0	—	—	—	—
218	—	100.0	—	—	—	—
223	—	100.0	—	—	—	—

July, 1985 and 1986. It constituted 6.3% in 1985 and it was as low as 0.2% in 1986. The catch consisted of fully mature and spent-recovering prawns in appreciable quantities during all the months of observation. The composition of mature prawns ranged between 28.6 and 45.3% in 1985; between 30.1 and 35.8% in 1986 and between 16.5 and 64.7% in 1987. Similarly, the composition of prawns in spent-recovering stage was also found to be high in all the months during the three year period of observation. It ranged from 28.1 to 51.4% in 1985; from 33.1 to 45.4% in 1986 and from 29.4 to 51.4% in 1987 (Fig.2).

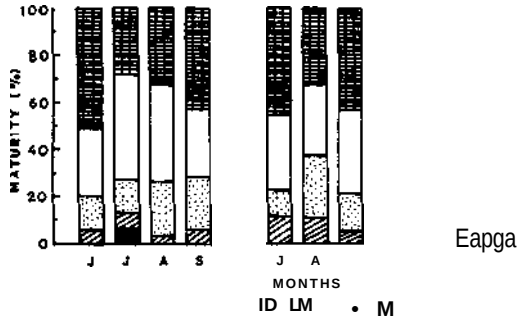

Fig. 2. Distibution of different stages of maturity in the females of *P. indicus* landed at Periathalai village during the years 1985-'87. (IMM - Immature; EM - Early maturing; LM - Late maturing; M - Mature and SP - Spent-recovering).

DISCUSSION

The prawn fishery of the Periathalai coast is a seasonal one and extends for a short period of three or four months only commencing in late June or early July and closing in September or October every year before the onset of north-east monsoon. During this short period a hectic activity can be observed in the landing centre as most of the units are put into operation to exploit the seasonal occurrence of *P. indicus* from the sea. It is interesting to note that the gillnet catches landed at Periathalai consisted of a single species of prawn whereas Lalitha Devi (1985) and Sukumaran (1987) have observed the occurrence of more than one species of prawn in the gillnet catches landed along the coasts of Andhra Pradesh and Karnataka respectively.

The estimated catch of P. *indicus* landed at Periathalai during the three year period of observation did not vary much although wide fluctuations in the catches were recorded during different months. For instance, the catches of *P. indicus* landed in the month of August, 1985 and 1986 were 4.7 and 5.7 tonnes respectively whereas in 1987 the estimated catch was 32.7 tonnes for the same month. Similar fluctuation has also been recorded by George and Mohamed (1967) in the seasonal prawn fishery of the Kanyakumari district, which was also constituted exclusively by P. *indicus.* The fishery of the Kanyakumari district commenced in May/ June i. e. about one month earlier than the commencement of the prawn fishery at Periathalai coast. The month of maximum catch in the fishery of Kanyakumari district varied from year to year. The catch was maximum in June during 1959 and 1960. But during I960 and 1961 it was maximum in August and July respectively. In the present investigation the maximum catch was recorded only in July during all the three years of observation. In both the fisheries a gradual decrease was recorded in the catches in the month following the month of maximum catch. However, a marked increase was recorded in the catches landed at Periathalai coast in September during 1985 which may be due to the maximum effort expended therein. An analysis of the size composition of the prawns in the two fisheries indicate that the range was wider in the catches landed at Periathalai. As against the range of 130 to 195 mm recorded in the fishery of Kanyakumari district the range recorded in the present investigation was 121 to 213 mm.

It has been observed by George and Mohamed *(loc. cit.)* and Manissery and Manimaran (1981) that the prawns exploited along the coasts of Kanyakumari and Tirunelvely districts might be those migrated from the Kerala coast. Their hypothesis was conclusively proved when the prawns (P. *indicus)* tagged and released in the Cochin Harbour were recovered by the fishermen from the Gulf of Mannar off Ovari, Periathalai and Manapad (Anon., 1982). In this context the studies on the seasonal prawn fishery of the Periathalai coast assumes great significance as it throws light on the intensity of migration of the prawn stock and also on various aspects of the biology of the prawn migrating from the west coast to the east coast. Based on the recovery of a single tagged female prawn in spent condition from the Gulf of Mannar off Periathalai, it was suggested previously that the movement of the prawn from the west coast to the east coast may be a spawning migration (Anon., 1982). A comparison of the female population in the seasonal prawn fishery of the Kanyakumari district reported by George and Mohamed *(loc. cit.)* with that of the present one further

strengthens this view. In both the fisheries immature females were seldom recorded in the catches. The catches landed at Kanyakumari district were dominated by females in early maturing and late maturing stages with poor representation of prawns in spent-recovering stage. On the otherhand, females in early maturing and late maturing stages constituted only a small proportion and females in mature and spent-recovering stages dominated the catches forming more than 75% of the female population landed at Periathalai coast. Thus it is evident that as the population migrates from the west coast to the east coasts the gonadial maturity of the prawn also advances. It may be mentioned here that the sex ratio observed in the two fisheries showed marked variations. In the catches landed in Kanyakumari district, males were predominant whereas in the present investigation the dominance of males was observed only in 1987 (Table 2).

Manissery and Manimaran *(loc. cit.)* have also observed the poor representation of immature prawns (P. *indicus)* in the trawl catches of Manapad, a neighbouring centre of Periathalai. According to them late maturing and mature females were predominant from July to October and prawns in spent-recovering stage were well represented in the catches during these months forming around 30%. The proportion of prawns in various stages of maturity observed by them is in close conformity with what has been observed by us. Thus the present investigation further confirms the views of the earlier authors that the movement of the prawn from the west coast to the east coast is a spawning migration.

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