

The Seasonal Fishery for *Penaeus indicus* along the Southwest and Southeast Coasts of India

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Abstract

Fishery for the prawn *Penaeus indicus* along the Trivandrum-Kanyakumari and Manappad coasts is seasonal, commencing by May-June and closing by October-November. Annual landing of the species ranged from 559 t to 1204 t during 1981-86. This fishery commences by the onset of the southwest monsoon, and is constituted by large-sized prawns (modes 151-155 mm to 171-175 mm in males and 196-200 mm in females). The high percentage (48%) of maturing and mature prawns indicates a breeding population contributing to the fishery. Occurrence of *P. indicus* population in sequence along the fishing centres of the southwest and southeast coasts suggests probable migration of the prawn from the former to the latter coast during the fishing season. This confirms the presently believed migratory behaviour of the species.

Introduction

The Indian white prawn *Penaeus indicus* H. Milne Edwards is one of the large-sized penaeid prawns of considerable commercial importance. Biology and fishery of the species have been studied by various workers and reviewed by Mohamed (1967). George and Mohamed (1967) studied the fishery of the species off the Kanyakumari coast and Manisseri and Manimaran (1981), off the Manappad coast. The fishery along Trivandrum and Kanyakumari on the southwest coast and Manappad (Tirunelveli district) on the southeast coast occurs seasonally year after year and is constituted exclusively by adult prawns. Biological and population characteristics of the species, as evidenced by mark-recovery experiments and biological investigations suggest a long-distance migration from the coast of Kerala through Kanyakumari coast to Tirunelveli coast (George and Mohamed, 1967; Manisseri and Manimaran, 1981; Anon., 1982). Details on the stock position and movement are necessary for management of the fishery in different fishing areas. An attempt is made here to make a quantitative study with reference to the season and period of peak landing at different centres.

Material and Methods

The study was conducted along the coasts of

Trivandrum, Kanyakumari, Tirunelveli and Ramanathapuram districts. Data on total landing of *P. indicus* along these districts were collected on a monthly basis during 1981-86. Data on the total landing of other penaeid prawns were also collected. As indigenous gears are widely used along Trivandrum and Kanyakumari coasts and both indigenous and mechanised gears are operated along Tirunelveli coast, an attempt is made to estimate the total landing of *P. indicus* by both the sectors.

Results and Discussion

Annual landing of *P. indicus* along Trivandrum, Kanyakumari and Tirunelveli coasts ranged from 559 t to 1204 t during the period under study (Table 1). The total landing along Trivandrum coast alone was 511 t, 98.6% of which was landed during May-August. Similarly the total landing along Kanyakumari coast was estimated to be 1115 t, 94.3% of which was landed during the same months. Highest landing was obtained along the coast of Tirunelveli, it being 3,367 t during 1981-86. 83.2% of the catch was obtained during the peak season of June-October.

In 1981, the fishery for *P. indicus* commenced in June with peak landings in the same month, along both Trivandrum and Kanyakumari coasts (Table 1). A round-the-year fishery occurred along Tirunelveli coast with maximum landing (144 t) in August. The catches were fairly high from June to November. In 1982, the fishery appeared in May along Trivandrum and Kanyakumari coasts, the landing being maximum during May-June along the former and in July along the latter coast. Interestingly, peak monthly landing (108 t) was observed in the following month along Tirunelveli coast. In 1983 also, the fishery was at its best during this particular season with peak landings in July along all the three districts. In the following year peak monthly landing was obtained in June (101 t) along Trivandrum coast, July (106 t) along Kanyakumari coast and August (374 t) along Tirunelveli coast. Maximum landing of the species was recorded in June along Trivandrum (47 t) and Kanyakumari (180 t) coasts and July (367 t) along Tirunelveli coast, in 1985. A similar trend was noticed in 1986 also, with peak landings in May (39 t) along Trivandrum coast, June (200 t) along Kanyakumari coast and July-August (204 t), along Tirunelveli coast.

Manappad madai and Punnaikkayal madai (to the north of Manappad) are the two important trawling grounds off Tirunelveli coast. The former fishing ground is adjacent to Kanyakumari and harbours only a seasonal fishery, predominated by large-sized *P. indicus*. On the other hand,

there is a round-the-year, multi-species fishery for penaeid prawns in the inshore waters of Punnaikkayal. *P. indicus* is one of the species occurring here in good numbers. However, fishery for this species which occurs round-the-year is considerably less in magnitude when compared to that off Manappad (Manisseri and Manimaran, 1981). The seasonal trend in occurrence and abundance of the fishery is observed only in the fishery off Manappad.

The unique feature of the fishery for *P. indicus* off Trivandrum, Kanyakumari and Manappad is its abrupt appearance in huge quantities during May-June every year. The peak of the fishery is observed along Trivandrum coast towards the beginning of the season, along Kanyakumari immediately after that and along Manappad in the following month. This suggests a movement of the population from north to south along the southwest coast and from south to north along the southeast coast, around Cape Comorin. This pattern of movement confirms the present understanding of migration of *P. indicus* (George and Mohamed, 1967; Manisseri and Manimaran, 1981; Anon., 1982).

The fishery for *P. indicus* along Ramanathapuram coast is of lesser magnitude when compared to that off the Tirunelveli coast. The annual landing along this coast ranged from 45 t to 394 t as against 260 t to 868 t along Tirunelveli coast (Table 1). This fishery does not show a trend of seasonal occurrence which is characteristic of the fishery off Trivandrum, Kanyakumari and Manappad. Maximum landings were recorded in different months such as January, March, April, June, August and December during 1981-86. Hence it is likely that *P. indicus* which appears regularly in large quantities during May-June along Trivandrum, Kanyakumari and Manappad coasts may not be moving further north to Ramanathapuram coast. This is in agreement with the inference drawn by earlier workers from biological and mark-recovery studies (Manisseri and Manimaran, 1981; Anon., 1982).

The fishery for *P. indicus* along Trivandrum and Kanyakumari coasts is exploited almost entirely by non-mechanised sector. Gill net, cast net, boat seine, and 'Disco valai' are the gears operated from country boats and catamarans (George and Mohamed, 1967; Joel, 1985). Landings by this sector along Trivandrum and Kanyakumari coasts, during 1985-86 were 81.7% and 98.8%, respectively (Fig. 1). The absence of trawling in the inshore waters towards the south of Trivandrum may be explained by the nature of the shelf which is rather steep with rocky and sandy patches. Prawn fishery off Tirunelveli is exploited mainly by the mechanised sector. Landings by this sector in 1985 and 1986 were 71% and 60.8%, respectively.

The magnitude of the migrating population of *P. indicus* was not known so far. The present study shows that along Trivandrum, Kanyakumari and Tirunelveli coasts, the last part of the migratory route, the average annual landing

(1981-86) is about 832 t. This seasonal fishery assumes importance as it is constituted by *P. indicus* belonging to large size-groups (George and Mohamed, 1967; Manisseri and Manimaran, 1981). An important feature of the fishery is the occurrence of large numbers of maturing and mature individuals throughout the season. The high frequency of occurrence of late maturing and mature stages, constituting about 48% of the catches, indicates the possibility of a breeding population contributing to the fishery (Manisseri and Manimaran, 1981).

The seasonal fishery for *P. indicus* occurs during the southwest monsoon period when intense physico-chemical changes take place along the southwest coast. Movements of animals avoiding such disturbances have been reported by many workers (Banse, 1959; Ramamirtham and Jayaraman, 1960; George *et al.*, 1963; Rao, 1972). Johannessen *et al.* (1987) reported penetration of low-oxygen water over the entire shelf of the southwest coast during southwest monsoon due to upwelling which was less significant towards the south of Quilon. This phenomenon also may be promoting the movement of *P. indicus* from off the southwest coast to the south of Quilon - the inshore waters off Trivandrum, Kanyakumari and Tirunelveli.

Acknowledgements

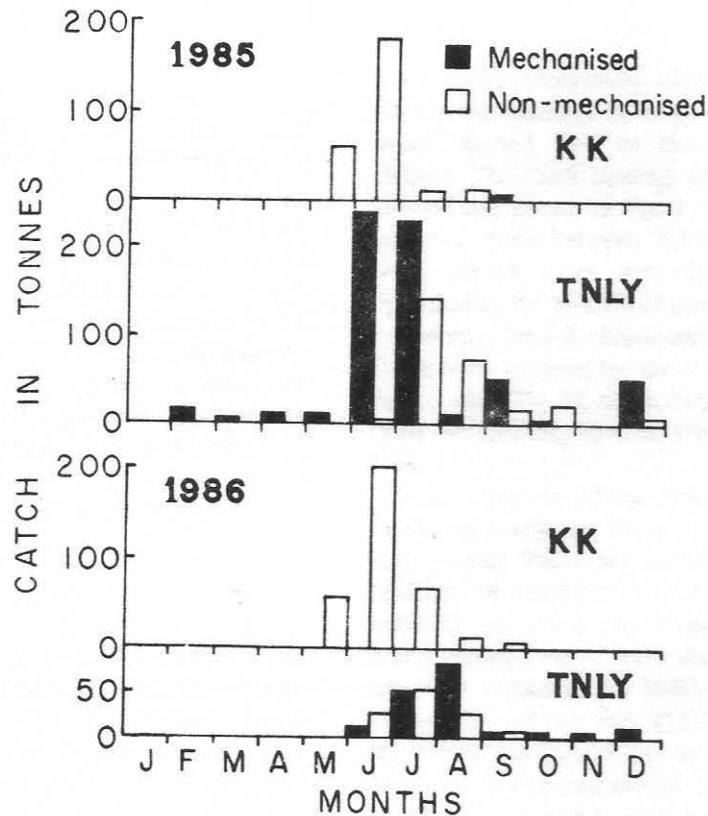
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Table 1. Monthly landing (in tonnes) of *P. indicus* along the coast of Trivandrum, Kanyakumari, Tirunelveli and Ramanathapuram during 1981-1986

Year	Districts	Months												Total		
		Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.			
1981	Trivandrum						25									25
	Kanyakumari						10	5	2	3	5	2				27
	Tirunelveli	9	10	3	7	12	77	67	144	4	105	44	25			507
	Ramanathapuram	1	15	6	193	11		41	1		23	16	17			324
1982	Trivandrum		2			33	24			4						63
	Kanyakumari					1	20	70	8							99
	Tirunelveli	44	25	17	14	1	15	67	108	28	55	21	8			403
	Ramanathapuram	17	3	4	144	2	154	2	9	7	51	1				394
1983	Trivandrum						30	94	61							185
	Kanyakumari					4	55	70	8			40				177
	Tirunelveli	8	13	2	60	20	86	498	58	63	34					842
	Ramanathapuram		19		17		2	5	4	3	4	6	148			208
1984	Trivandrum						101		17							118
	Kanyakumari						39	106	62							207
	Tirunelveli	1	87	10	3	10	6	4	295	69	2					487
	Ramanathapuram	54	27	94	9	7	7	1	95	5	3	5	69			376
1985	Trivandrum					9	47	1		1						58
	Kanyakumari					61	180	10	12	7	1					271
	Tirunelveli	1	14	5	11	10	236	367	78	68	21		57			868
	Ramanathapuram	30	2				2	1	1	1	2	4	2			45
1986	Trivandrum					39	8	15								62
	Kanyakumari					54	200	65	9	6						334
	Tirunelveli			1	1		30	101	103	9	5	3	7			260
	Ramanathapuram	21	1	4	1		2	5			6	9	15			64

Fig. 1. Catch (in tonnes) of *P. indicus* by mechanised and non-mechanised sectors along Kanyakumari and Tirunelveli coasts during 1985-86.