

Seasonal Fishery for *Parapenaeopsis stylifera* with Comments on its Possible Recruitment Along the Coasts of Trivandrum, Kanyakumari and Thirunelveli Districts, South India

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ABSTRACT

Though the prawn, *Parapenaeopsis stylifera* does not contribute much to the fishery along the south-east coast of India, its abrupt seasonal appearance during July-November along the coasts of Thirunelveli, Kanyakumari and Trivandrum, which amounted to about 1,614 t during 1981-86 seasons, is of great interest from the point of view of its biology and behaviour. Of the two major trawling grounds off Thirunelveli, Manappad Madai sustains a good seasonal fishery for the species, the landing in 1978 being 163 t. However, fishery to the north of Manappad along the south-east coast is of lesser magnitude and does not show any seasonal pattern of occurrence. It is interesting to note that in comparison with the fishery for the species at Neendakara in the south-west coast, the fishery off Manappad shows higher size-frequency distribution with more mature specimens and the peak season occurs in the months of October-November. These facts possibly indicate the movement of the species towards south from Neendakara and to further north upto Manappad, round the Cape Comorin as recorded in the case of *Penaeus indicus*.

INTRODUCTION

Parapenaeopsis stylifera (H. Milne Edwards, 1837), one of the economically important penaeid prawns in India, is known for its abundance along the south-west coast of the country. Salient features of the population characteristics, magnitude of resource, biological characteristics and rate of exploitation of the species along this coast have been studied by Rao (1970), George *et al.* (1980, 1983) and Alagaraja *et al.* (1986). However, only scanty information is available on the fishery and biology of *P. stylifera* along the south-east coast and the coasts of Trivandrum and Kanyakumari, south of Quilon on the south-west coast of India. It is in this context that a study was undertaken with special reference to the trends in production, seasonal abundance, biological characteristics and the possible source of recruitment of the species to the fishery of this region.

MATERIAL AND METHODS

Weekly observations were made on the total landing, effort expended and biological characteristics of *P. stylifera* landed along with other penaeid prawns at the Tuticorin fisheries harbour in 1978. Trawlers based at this centre exploit a round the year fishery for commercially important penaeid prawns from the Punnaikkayal fishing ground. However, a strictly seasonal fishery for the species occurs during September-November at Manappad, to the south of Punnaikkayal, along the same coast. Catches from Manappad are landed generally at Virapandiyanpattanam and Tiruchendur. This fishery was also under observation during 1978 and biological parameters such as total length

(measured from the tip of rostrum to the tip of telson), sex, maturity stages, etc. were recorded. For the purpose of getting a total picture of production of the species from the southern part of the south-west and south-east coasts, the landing data from 1981 to 1986 were collected from the Fishery Resources Assessment Division of the Central Marine Fisheries Research Institute, Cochin.

RESULTS AND DISCUSSION

Monthly landing of *P. stylifera* along the coasts of Kanyakumari and Thirunelveli districts for the period 1981-86 is shown in Fig. 1. Fishery along the Kanyakumari coast is mostly restricted to August and September. *P. stylifera* is landed only occasionally along the Trivandrum coast. About 3 t of the species were landed in August, 1982 and 6 t in September, 1986. Interestingly, catches occurred during the same months as in Kanyakumari. Although the fishery for the species along the coast of Thirunelveli district on the south-east coast occurs throughout the year, the peak season is during September-October. An analysis of the data collected along this coast in 1978 revealed the occurrence of a seasonal fishery for the species during September-November at Manappad. It is noteworthy that the species made an abrupt appearance in September (Table 1), the catch being nil in the previous months of June-August when there were intense trawling activities recording heavy landings of *Penaeus indicus* as reported by Manisseri and Manimaran (1981). The landing of *P. stylifera* at Virapandiyanpattanam rose from 7,792 kg in September to 1,24,050 kg in October even though the monthly effort in fishing trips declined from 4,485 in the former to 3,550 in the latter month. A

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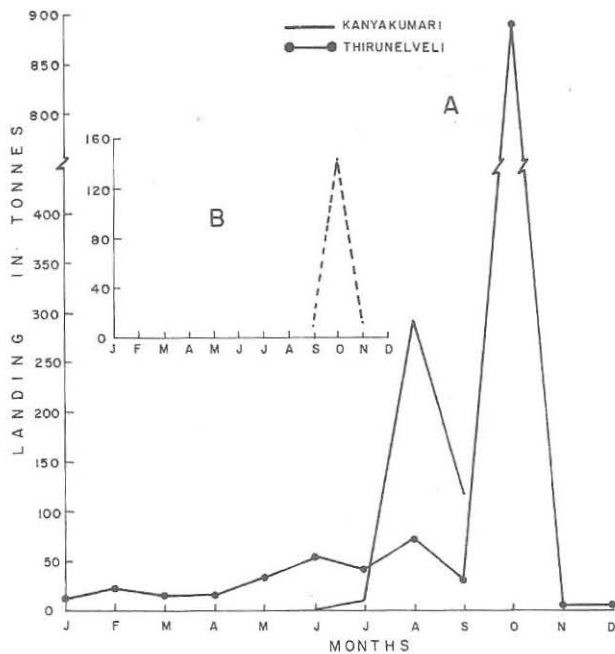


Fig. 1. Monthly landing (in tonnes) of *P. styliifera*. A - Along the coast of Kanyakumari and Thirunelveli districts during 1981-86, B - From the fishing ground off Manappad in 1978

similar trend was noticed at Tiruchendur also. Catches decreased considerably in November marking closure of the season. The increase in the total landing and catch per unit effort from September to October is spectacular, pointing to the possibility of heavy recruitment of the species during this period.

Total monthly landing of *P. styliifera* from Punnaikkayal Madai, the other trawling ground along Thirunelveli coast, during the year 1978 is presented in Table 2. As seen from the table, contribution of the species to the penaeid prawn fishery at this centre is very little. Although in small quantities, the species occurs in all the

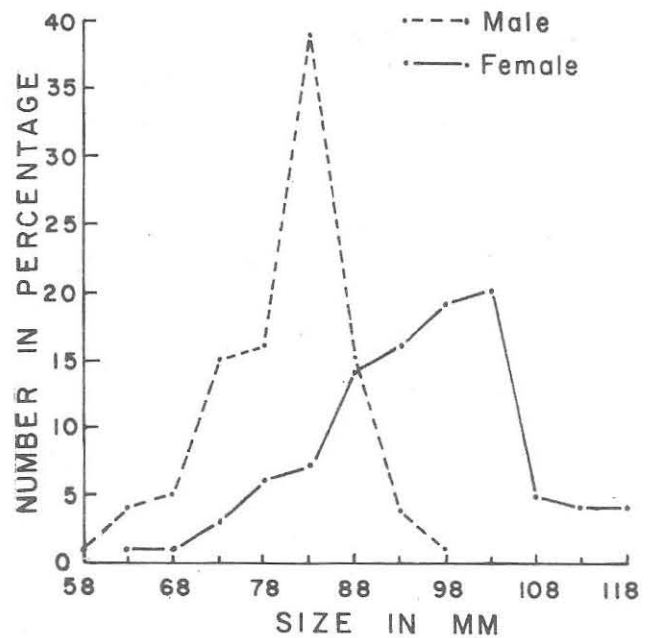


Fig. 2. Size-frequency distribution of *P. styliifera* from the Manappad fishing ground in October, 1978

months, thus differing from what is observed at Manappad, Kanyakumari and Trivandrum.

Size-frequency distribution of male and female *P. styliifera* from Manappad in October, the month of peak occurrence, is given in Fig. 2. The modal sizes of males and females being 81-85 mm and 96-105 mm respectively, this fishery seems to be sustained by larger size groups. It is worth mentioning here that the sizes preferred by the industry is normally above 65 mm (George *et al.*, 1983). Females predominated the catches from Manappad, contributing to 58.5% of the total landing. Different maturity stages of female *P. styliifera* from Manappad are

Table 1. Total landing (in kg) of *P. styliifera* by trawlers at Virapandiyanpattanam and Tiruchendur in 1978

Month	Virapandiyanpattanam			Tiruchendur				Grand Total
	Effort in fishing trips by trawlers	<i>P. styliifera</i>	Other species	Total	Effort in fishing trips by trawlers	<i>P. styliifera</i>	Other species	
June	266		6,857 (25.8)	6,857				6,857
July	2,768		77,725 (28.1)	77,725	2,656		70,593 (26.6)	1,48,318
August	5,382		87,137 (16.2)	87,137	2,574		37,660 (14.6)	1,24,797
September	4,485	7,792 (1.7)	53,396 (11.9)	61,188	1,113	1,205 (1.1)	9,624 (8.6)	72,017
October	3,550	1,24,050 (34.9)	26,645 (7.5)	1,50,695	665	19,149 (28.8)	4,844 (7.3)	1,74,688
November	250	11,100 (44.4)	1,310 (5.24)	12,410				12,410
Total	16,701	1,42,942	2,53,070	3,96,012	7,008	20,354	1,22,721	5,39,087

Catch per boat trip in parenthesis

Table 2. Total landing (in kg) of *P. stylifera* at the Tuticorin fisheries harbour in 1978

Month	Effort in boat trips	<i>P. stylifera</i>	Other species	Total
January	1,776	250	15,722	15,972
February	1,692	554	18,316	18,870
March	1,971	36	15,840	15,876
April	2,178	56	39,244	39,300
May	2,250	240	21,786	22,026
June	1,098	150	10,884	11,034
July	1,274	120	13,550	13,670
August	1,170	90	15,821	15,911
September	1,680	75	20,112	20,187
October	2,120	658	22,902	23,560
November	2,236	700	21,695	22,395
December	2,160	90	25,830	25,920
Total	21,605	3,019	2,41,702	2,44,721

classified following Rao (1968) and presented in Fig. 3. It is interesting to note that late maturing and mature females contributing to 59.6%, predominated the catches.

It is a well known fact that in the north of Trivandrum, off Neendakara and Sakthikulangara along the south-west coast, a highly seasonal lucrative fishery

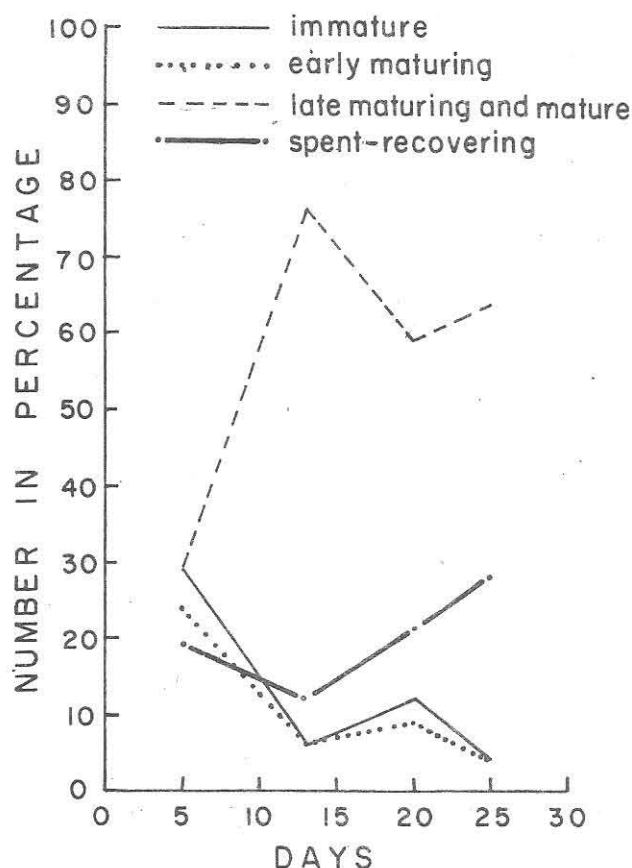


Fig. 3. Maturity stages of female *P. stylifera* from the Manappad fishing ground in October, 1978

exists for *P. stylifera*. This fishery starts in the month of June, records maximum catches either in July or in August and decreases in September (George *et al.*, 1980, 1983). The present observations show that fishery for the species further south along the same coast and at Manappad in the south-east coast commences in small quantities in July-August, reaches a peak, usually in October and decreases in November. As *P. stylifera* is known to spend its whole life cycle in the marine environment (George, 1973), recruitment to this seasonal fishery can take place from a nearby marine source only. It is quite unlikely that recruitment takes place from the Punnaikkayal fishing ground or from further north, where this species occurs in very small quantities. Therefore, the abrupt seasonal appearance of the species along the Kanyakumari and Manappad coasts, with peak occurrence in the subsequent months following a reduction in the population along the Neendakara coast may possibly indicate the recruitment of the species from the latter area by its movement down south to Kanyakumari and to further north upto Manappad along the south-east coast, round the Cape Comorin. A comparative study of the size-frequency distribution of *P. stylifera* from Neendakara and Manappad further strengthens this point of view. Size distribution analysis shows that fishery from Manappad is constituted by larger size-groups. According to George *et al.* (1983), bulk of the catch from Neendakara was made up by males of 56-95mm and females of 56-105 mm size groups. Smaller sizes below 65 mm dominated the fishery towards the end of June. It was also reported that the proportion of late maturing and gravid females was insignificant. On the contrary, about 85% of the male *P. stylifera* from Manappad belonged to 71-90 mm size group and 69% of the females to 86-105 mm size group. Further, about 60% of the females in this fishery were found to be late maturing or mature as against 11% immature females.

The fact that the sporadic catches of *P. stylifera* in Trivandrum and Kanyakumari are mostly in August might suggest the possibility of the movement of the species commencing in late July or early August and recruitment in the fishing ground at Manappad in September-October. However, only extensive mark-recovery experiments on the species at Neendakara area in the months of July, August and September may help in making definite conclusions on the suggested possibility of the source of recruitment of *P. stylifera* at Manappad area. It may be mentioned here that migration from the south-west to the south-east coast is already known in the case of another penaeid prawn, *P. indicus* (George and Mohamed, 1967; Manisseri and Manimaran, 1981; Anon. 1982; Manisseri, 1988).

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