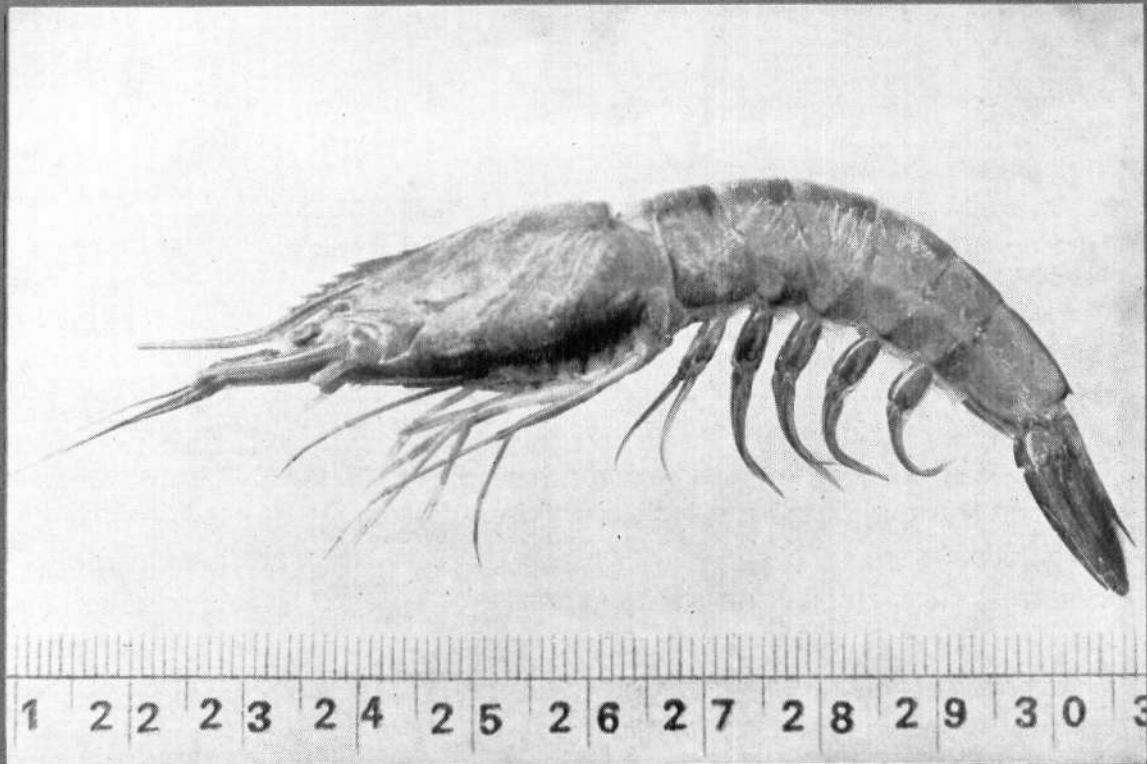




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भारतीय कृषि अनुसंधान परिषद
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THE "KARIKKADI" FISHERY OF KERALA

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Parapenaeopsis stylifera, popularly called 'Karikkadi Chemmeen' in Malayalam, is the most important species of prawn contributing to the commercial fishery of Kerala coast. It is a small sized prawn rarely found growing beyond 135 mm in total length. Being strictly a marine species it does not enter into estuarine

areas at any stage of its life except sometimes in high saline conditions. Females are slightly larger in size than males and attain sexual maturity when they are about 75 mm size which is approximately five months old. Breeding takes place throughout the year with peaks during November-December and March-April.

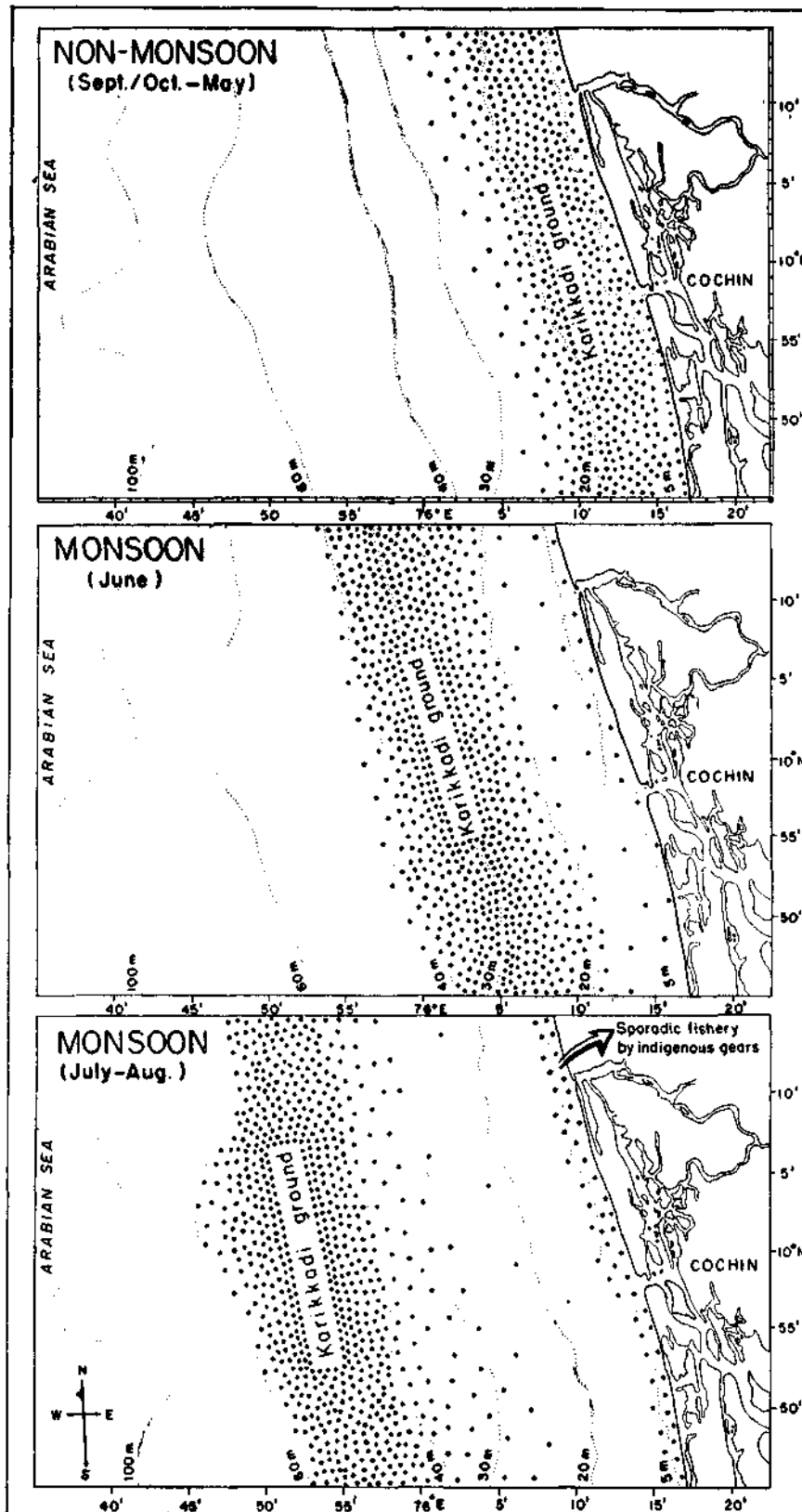


Fig. 1. Map showing Karikkadi grounds off Cochin. Dotted areas indicate distribution and relative abundance of stock.

It spawns many times during its life time in the coastal waters within about 20 m depth and produces an average of about 40,000 to 2,36,000 eggs at each spawning. Metamorphosis is completed in the sea within 17-26 days. Growth is rapid in the early stages upto about 70-80 mm size, but thereafter it slows down progressively. The species lives for about 1.5 years.

Resource distribution

Though the species occurs throughout the Indian coasts, its maximum abundance is observed along the Kerala coast where it exists upto about 60 m depth. Recent experimental shrimp trawling conducted by the Institute at Cochin over a period of two years has shown that during the non-monsoon period (September/October to May) most of the shrimp stocks occupy the coastal waters within the 20 m depth contour. With the commencement of southwest monsoon and the consequent changes in the environmental conditions, the prawns leave the inshore areas in large numbers to the deeper zones. They remain mostly in the 20-40 m depth zone during June and in the 40-60 m depth zone during July and August/September. A small population of the species, however, exists very close to the shore within 5 or 6 m depth, during the monsoon period, which is predominantly constituted by adults in spawning condition. The change in the distribution and abundance of 'Karikkadi' population in space and time off Cochin is depicted in Fig. 1.

Exploitation

'Karikkadi' is exploited throughout the Kerala coast and it accounts 38-50% of the total prawn landings of the state. Being strictly a bottom dweller, it

is mainly caught by shrimp trawls operated by small mechanised boats (9-13 m size) undertaking daily trips. Shrimp trawling is carried out almost all along the coast, the major landing centres being Saktthikulangara,



Fig. 3. Proportion of juveniles of 'Karikkadi' in the trawl catches at Saktthikulangara during monsoon season.



Fig. 2. Sorting of 'Karikkadi' catch at Saktthikulangara during monsoon season.

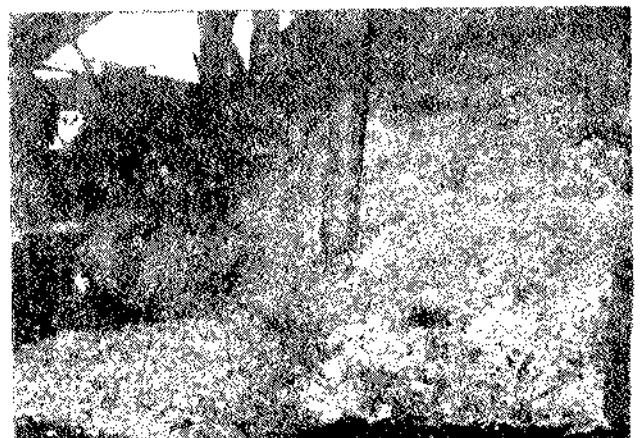


Fig. 4. Heap of undersized 'Karikkadi' and other prawn discards being used as manure.

Cochin, Munambam and Calicut. The trawl fishery usually commences by September or October and ends with the on-set of southwest monsoon except at Sakthikulangara and Cochin where it continues throughout the southwest monsoon period reaching peak in July/August. During the non-monsoon period trawling is mostly confined to the coastal waters within 25 m depth which is about 18 km from the shore while during monsoon period (June to August/September) the vessels move out to the offshore waters and operate between

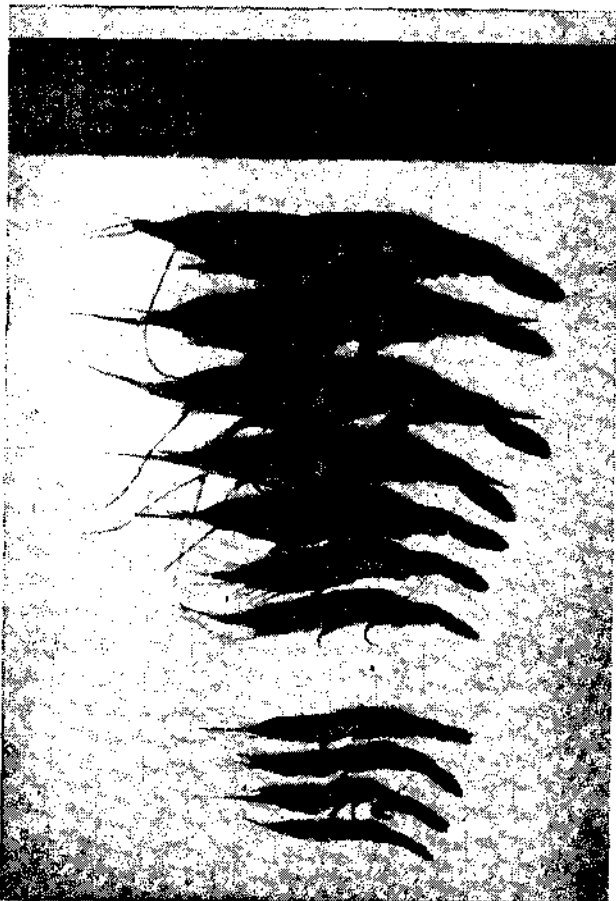


Fig. 5. Different sizes of 'Karikkadi' caught by 'mini trawls'.

30 and 60 m depth (*i.e.* about 22 and 48 km respectively from shore) following the offshore migration of 'Karikkadi'. It is not certain whether the offshore population returns to the coastal waters or not after the cessation of southwest monsoon. In the total 'Karikkadi' landings of the state, shrimp trawlers account about 95%. Of this, 61.6% is landed during the monsoon period, particularly at Sakthikulangara and Cochin.

Small quantity of 'Karikkadi' (about 5%) is also caught by indigenous gears such as boat seines, shore seines, gill nets, cast nets *etc.*, which operate in the

shallow coastal waters less than 10 m depth not covered by the trawlers. The coastal area between Trichur and Malappuram are the important areas where 'Karikkadi' is often caught by these nets along with fish and other varieties of prawns. More recently, a type of mini-trawl operated by modified country crafts fitted with outboard engines have also been introduced into the fishery in large numbers along the coastal waters fished by the marginal fishermen during the non-monsoon period.

Table 1. Annual production of 'Karikkadi' and its percentage in total prawn landings of Kerala State, 1982 to 1986

Year	Landings of 'Karikkadi' (tonnes)		Total	Percentage in total prawn landings
	Trawls	Indigenous gear		
1982	11,025	91	11,116	41.6
1983	12,383	554	12,937	43.5
1984	16,746	998	17,744	49.9
1985	9,875	469	10,344	38.8
1986	15,713	1,962	17,675	47.6
Average	13,148.4	814.8	13,963.2	44.8

An analysis of the catch data for the period 1982-'86 (Table 1) indicates an average production of 13,963 tonnes of this species forming 44.8% of the total prawn landings of the state. Shrimp trawlers account 13,148 tonnes (94.2%) of which about 8,103 tonnes (61.6%) are registered during the monsoon period. The production within the state is highly varying at different centres. The average annual landings recorded at the

Table 2. Trend of 'Karikkadi' fishery by shrimp trawlers at Sakthikulangara, 1982 to 1987

Year	Estimated effort (No. of boat trips)	Catch of 'Karikkadi' (tonnes)	CPUE (kg/boat trip)
1982	1,25,499	7,376	58.8
1983	1,08,350	5,446	50.3
1984	1,30,357	10,838	83.1
1985	1,24,544	6,871	55.2
1986	1,20,779	5,594	46.3
1987	1,39,326	10,510	75.4
Average	1,24,809	7,773	62.3

major centres viz., Sakthikulangara, Cochin, Munambam and Calicut are 7,773, 18,54,317 and 108 t respectively. The estimated number of boat trips and the annual CPUE recorded are 1,24,809 and 62.3 kg at Sakthikulangara, 43,916 and 42.2 kg at Cochin, 15,214 and 20.9 kg at Munambam and 5,231 and 21.6 kg at Calicut. Nearly 70% of the 'Karikkadi' catch by shrimp trawlers is landed at Sakthikulangara and Cochin. In the total landings by indigenous gears (815 t/yr) about 73% is contributed by boat seines.

Annual trends in production

Before the introduction of shrimp trawling along this coast the prawn production was very low and it

Table 3. Trend of 'Karikkadi' fishery by shrimp trawlers at Cochin Fisheries Harbour, 1982 to 1987

Year	Estimated effort (No. of boat trips)	Catch of 'Karikkadi' (tonnes)	CPUE (kg/boat trip)
1982	51,098	1,525	29.8
1983	43,157	2,198	50.9
1984	39,613	1,633	41.2
1985	28,095	430	15.3
1986	46,093	2,471	53.6
1987	55,438	2,867	51.7
Average	43,916	1,854	42.2

Table 4. Trend of 'Karikkadi' fishery by shrimp trawlers at Munambam, 1982 to 1987

Year	Estimated effort (No. of boat trips)	Catch of 'Karikkadi' (tonnes)	CPUE (kg/boat trip)
1982	9,538	119.2	12.5
1983	11,036	432.6	39.2
1984	12,683	261.3	20.6
1985	8,575	35.7	4.2
1986	20,779	332.5	16.0
1987	28,673	722.6	25.2
Average	15,214	317.3	20.9

was predominantly constituted by 'Poovalan' (*Metapenaeus dobsoni*). As trawling began, the magnitude and composition of the fishery changed and today 'Karikkadi' is the mainstay of the shrimp industry of the Kerala State.

An examination of the recent catch statistics indicates an increasing trend in the production of 'Karikkadi' from 11,116 t in 1982 to 17,744 t in 1984 and after a steep decline to 10,344 t in 1985 it increased again to 17,675 t in 1986 (Table 1). Though the annual landings at Sakthikulangara highly fluctuated between 5,446 and 10,838 t (Table 2) a regular increasing trend is noticed at the northern centres since 1985 (Tables 3 and 4).

Problems and recommendations

The wide annual fluctuations observed at important centres like Sakthikulangara and the occurrence of juvenile prawns in large quantities noticed quite often in the fishery call for proper management and conservation measures for which the following suggestions are offered.

1. As spawning and early life stages of 'Karikkadi' are restricted to the shallow coastal waters within 20 m depth, the existing fishing regulations preventing operation of shrimp trawlers in these areas should be strictly enforced.
2. In order to prevent the indiscriminate capture of juvenile prawns less than 70 mm in total length, the present mesh size of the cod-end of trawl nets should be increased to at least 35 mm.
3. Operation of 'mini trawl' which has mesh sizes as small as 16 mm and is operated in the shallow coastal waters catching mainly the juvenile prawns (25-60 mm size) should be discouraged.
4. During the southwest monsoon period, since 'Karikkadi' is mainly concentrating in the offshore waters and the trawl catch does not contain an alarming proportion of breeding population, shrimp trawling in the deeper waters beyond the 30 m depth line may be advantageous to the fishery.

