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PRAWNS IN PURSE SEINE CATCHES*

Introduction

With the recent introduction of purse seine fishing along Karnataka and Kerala coasts there has been considerable improvement in the catches of pelagic shoaling fishes such as oil sardine and mackerel from these waters. In Karnataka state the purse seiners are operated mostly in South Kanara, centred around Mangalore, Malpe and Gangoli, the total number of purse seiners in operation in these centres rising to 261 during the last 4-5 years. At Cochin Fisheries Harbour, the only centre from where purse seines are operated in Kerala, there is a substantial landing of oil sardine, mackerel and other fishes like carangids by this gear, numbering about 60 in 1981.

The total estimated landings by purse seines at Cochin for the year April 1981-March 1982 was 17,050 tonnes, of which the Indian oil sardine *Sardinella longiceps* contributed 13,949 t forming 81.81% of the total catch, the Indian mackerel *Rastrelliger kanagurta* formed 1,836 t constituting 10.77% followed by carangids composed mainly of *Alepes kalla, A. djeddabba, Megalaspis cordyla* and *Scomberoides tol* contributing 399 t forming 2.3% of the total catch. At Mangalore the total landings by purse seines in 1981 were 42,269 t of which 27,215 t were contributed by oil sardine, 3,960 t mackerel, 3,990 t cat fishes, 2,322 t anchovies, 1,961 t tunnies, 1,635 t carangids and the rest other miscellaneous fishes. Prawns being demersal in habit, occur rarely in purse seine catches. But during 1981 and especially in 1982 on a few days unprecedented catch of prawns, contributed mostly by a single species, was noticed in the purse seine operations both in Kerala and Karnataka (Fig. 1-6). A study of these prawns occurring in purse seine catches has been attempted.

Prawn catches in purse seines at Cochin

On 28 th and 29 th April, 1982 unusually heavy landings of prawns were noticed in some purse seines operated by 42' vessels with 110 Hp engines, south west off Cochin at a depth range of 15-20 m. The prawn catch, composed exclusively of *Metapenaeus dobsoni* (Poovalan chemmeen), was estimated at 67,990 kg on 28.4.82 with the catch per unit fluctuating between 1,000 and 1,800 kg, the mean catch per unit per day being 1,133 kg. On 29.4.82 the intensity of the prawn catch dwindled, with the landings coming down to 33,070 kg with an average catch per unit of 601 kg. The oil sardine was also landed in good quantities on these days.

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Table 1. *Prawn (Metapenaeus dobsoni) catches (in kg) by purse seiners at Fisheries Harbour, Cochin.*

Date	No. of units operated	Average catch of prawns per unit	Estimated total catch	Estimated value in Rupees
19.12.81	62	1.59	99	860
21.12.81	55	2.16	119	1,100
22.12.81	55	2.54	140	1,250
24.12.81	40	3.22	129	950
28.12.81	52	2.57	134	1,075
1..1..82	53	84.90	4,500	65,000
4..1..82	55	19.20	1,056	7,300
20.1..82	55	65.45	3,600	30,600
4..2..82	8	128.75	1,030	8,500
18..2.82	52	60.57	3,150	24,410
28.4..82	60	1,133.16	67,990	5,33,780
29.4..82	55	601.27	33,070	2,84,400

Fig. 1. A carrier boat full of *M. dobsoni* at Malpe (2-9-82)

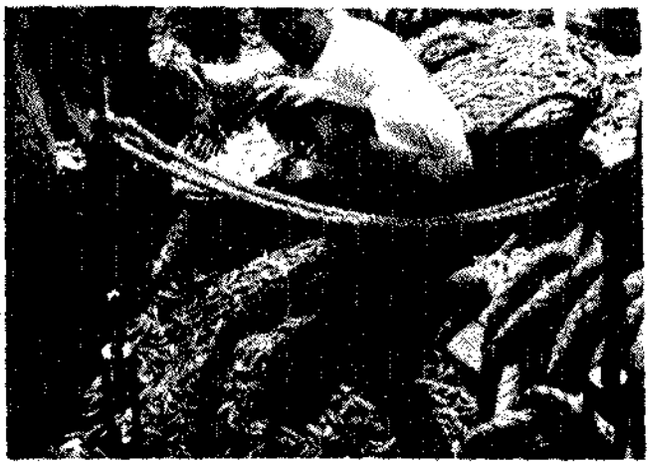

Fig. 2. Prawns being sorted on board a carrier boat.

Fig. 3. Unloading of *M. dobsoni* at Malpe from a purse seiner on 2-9-82.

Fig. 4. *M. dobsoni* at Malpe unloaded in baskets for transportation on 2-9-82.

Fig. 5. Catches being unloaded from a carrier boat at *Fisheries Harbour, Cochin.*

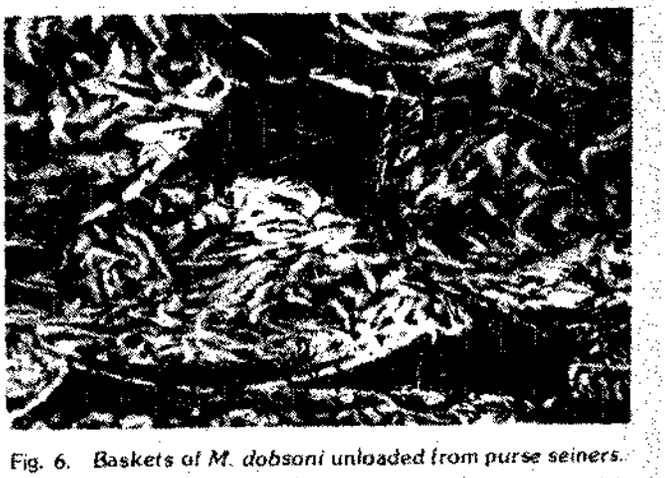

Fig. 6. Baskets of *M. dobsoni* unloaded from purse seiners.

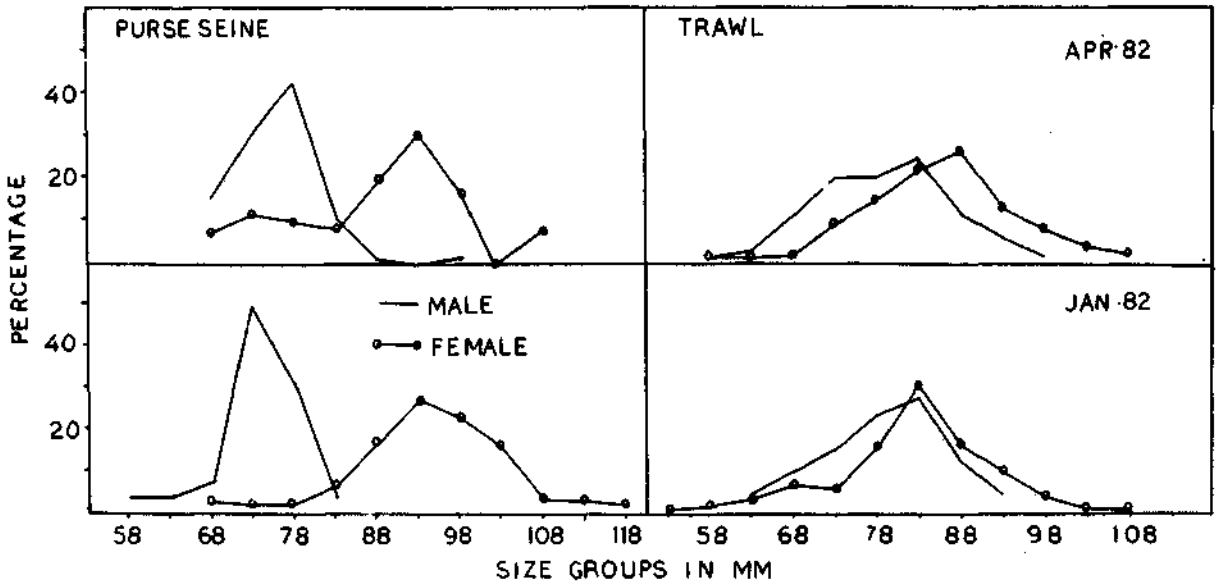

Fig. 7. Length frequency distribution of *M. dobsoni* in purse seine and trawl catches at Cochin.

On previous occasions also prawns have been caught in purse seines. For example on 1-1-82 two carriers of a purse seiner landed an estimated catch of 4,500 kg of *M. dobsoni*, which was auctioned at Rs. 65,000/-. It was interesting to note that apart from the single purse seine unit and its carriers, all other purse seine units and carriers on that day landed only oil sardine and carangids. The occurrence of *M. dobsoni* in appreciable quantities in the purse seines has been noted on few previous days also as may be seen from table 1. However, the maximum catch was recorded on 28 th April 1982. Females dominated in the purse seine catch in a ratio of 57:43, with the mature and late mature specimens forming 66% of the female population.

Size composition: Length measurements of random samples of *M. dobsoni* from purse seine landings of 1-1-82 revealed that the total length ranged from 55 to 85 mm for males with the dominant mode at 71-75 mm group and from 65 to 120 mm in females with the mode at 91-95 mm. On 28-4-82 the size ranged from 66 to 100 mm with the mode at 76-80 mm for the males, whereas the size range for the females was between 66 and 110 mm with the mode at 91-95 mm (Fig. 7). The size range and model sizes of the same species of prawn caught in the trawl nets from the same area and during the same period are also shown in the figure.

Purse seine prawn catches in Karnataka

In early September 1982, on resumption of fishing activities after the southwest monsoon, very large quantities of prawns were caught in purse seines operating at Mangalore and Malpe within the 15 m depth zone. On first 3 days of the month the catches were very high, showing a steep fall afterwards and disappearing by 8 th September. The catches of prawns by this gear during the period is estimated at 440.4 t and 320.9 t respectively at Mangalore and Malpe (Table 2), worth about 16 million rupees. In the previous two years also in September prawns were landed by purse seines at these centres. In 1980 the purse seine catches of prawns during the period were 395 t and 122.2 t in Mangalore and Malpe respectively and in 1981 much less, being 6.6 t and 15.0 t respectively at these two places. At Gangoli, situated about 60 km north of Malpe, it was surprising to note that there was very little catch of prawns in purse seines during the month, 2 t of prawns being landed only on 8 th September. At Karwar also prawns were landed by purse seines in September.

As at Cochin *M. dobsoni* (Poovalan) contributed to the bulk of the heavy catch, 98.3% and 93.3% respectively at Mangalore and Malpe. The rest of the catches constituted *Penaeus indicus* (Naaran), the Indian white prawn. However, on the first 3 days when there was very high catch

Table 2. *Prawn catch (in tonnes) in different gears during 1-8 September 1982 at Mangalore and Malpe (percentage of prawns in paranthesis)*

	Mangalore			Malpe		
	Purse seine	Trawl	Total	Purse seine	Trawl	Total
Number of units	816	1,560		754	1,547	
Total prawns	440.4	269.9	710.3	320.9	110.0	430.9
c/u in kg.	539.7	173.0		425.6	71.1	
M. dobsoni	432.8	257.1	689.9	299.5	108.6	408.1
	(98.3)	(95.2)	(97.1)	(93.3)	(98.7)	(94.7)
P. indicus	7.6	12.8	20.4	21.4	1.4	22.8
	(1.7)	(4.8)	(2.9)	(6.7)	(1.3)	(5.3)

M. dobsoni formed almost 100% of the landings. More or less the same ratio of sex distribution as at Cochin was noticed at both Mangalore and Malpe, the female to male ratio being 56:44. Around 67% of females were in spent/spent recovering stages at Mangalore and at Malpe these stages formed 42.4%. The mature and impregnated females were 22.7% and 24.4% respectively at Mangalore, while at Malpe these were 34.6% and 38.4% respectively.

Size composition: In comparison to the sizes landed at Cochin during the pre-monsoon period the sizes occurring in the purse seines at Mangalore and Malpe were much higher, mainly supported by the 1 year class and above. The sizes ranged from 76 mm to 105 mm with modal length at 91-95 mm in males and from 81 mm to 120 mm with mode at 106-110 mm in females at Mangalore. At Malpe the size ranged from 86 mm to 100 mm with mode 91-95 mm group and 91 mm to 120 mm with mode at 106-110 mm for males and females respectively, (Fig. 8). Thus the modal lengths of the species in the catches at both centres are the same. The size range and modal sizes of *M. dobsoni* caught in the trawl nets from Mangalore and Malpe during the same period are depicted in figure 2 for the sake of comparison.

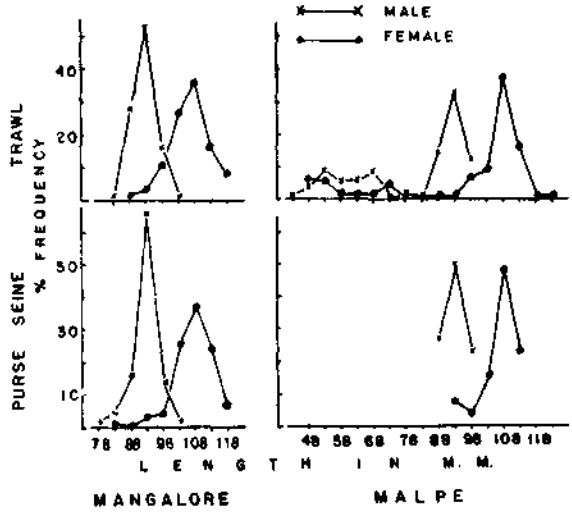

Fig. 8. Length frequency distribution of *M. dobsoni* in purse seine and trawl catches at Mangalore and Malpe.

General remarks

The sporadic occurrence of prawns in the purse seine catch on certain days appears to be brought about by the behaviour of the species. The coming up of prawns in the column of water during southwest monsoon due to upwelling nearer the shore and the resultant mud bank prawn fishery in the Ambalapuzha-Thottapally and Valappad-Nattika region of Kerala coast has been reported earlier. It has also been recorded that the pattern of fish and prawn distribution in the fishery changes due to the shoaling behaviour of the component species. However, such occurrences of prawns in the column of waters were reported during the southwest monsoon period and the present report of similar behaviour and consequent incidental catches in the purse seines in the pre-monsoon period at Cochin and immediately after the monsoon along Karnataka coast is interesting. It is quite possible that the behavioural pattern of the prawn is not dependent on upwelling.

Analysis of the sizes of the species of prawn represented in the purse seine catches in comparison to the sizes occurring in the trawl fishing grounds of the area during the same period gives certain interesting results. At Cochin a study on this line (Fig. 7) shows certain differences between the modal sizes in the two different gears, although the range in sizes is similar. The dominant size groups which are 71-75 mm in purse seine catches showed 81-85 mm in the trawl catches in the case of males, while in females they are 91-95 mm in the former and 81-90 mm in the latter. Thus the females show a higher modal length in purse seine catches while males show a lower modal length in the same when compared to trawl catches. The purse seine catches being dominated by females, the larger sizes of these females and majority of them with maturing and mature gonads would probably indicate that this behaviour of the shoals coming up in the column of water may have some connection with their spawning.

A similar analysis of the sizes of prawns represented in the purse seine and trawl catches of Karnataka coast (Fig. 8) gives a slightly different picture. The modal sizes of the prawns in the catches of both the gears in males as well as females are exactly the same in both centres, although the trawl catches at Malpe shows a much wider range in sizes when compared to the purse seine catches. Further the modal sizes of both males and females are much higher than that in the catches at Cochin. This is probably brought about by the difference in season, the reported occurrence of purse seine catches at Cochin being in January-April period and that at Mangalore and Malpe in September. However, the dominance of females in the purse seine catches of this coast along with the fact that majority of them were in spent/spent recovering stages would strengthen the point that the behaviour of the shoals moving up in the column of water is probably related with their spawning activities.

The large sizes of *M. dobsoni* occurring in the purse seine catches, particularly at Mangalore and Malpe would indicate that the population exploited consists of prawns at almost the fag end of their life and it appears that unless exploited at that time they may possibly perish due to natural mortality, especially since specimens larger than these sizes were seldom encountered in the fishery of the species any where along the coast. The occurrence of dead and decayed prawns of this species in the trawl catches during the season and large scale occurrence of shells and shell pieces noticed in the beaches and surf areas in the nearby coasts of Mangalore and Malpe towards the end of the monsoon season tend to support this view. Therefore, this seasonal exploitation of these large size prawns by purse seines may not pose any conservation problem. Though the occasional landings of prawns by purse seines at Cochin also need not be of much concern from the management point of view of prawn fishery in view of the sporadic nature, a close monitoring of purse seine catch is essential to see that purse seining does not affect the coastal trawl fishery that depends mainly on the penaeid prawn resources.