

OBSERVATIONS ON THE PRAWN FISHERY OF MANGALORE COAST DURING 1970-1980

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ABSTRACT

The annual yield of prawns in the Mangalore coast showed considerable fluctuations. The MSY is estimated to be around 1800-1900 t, at an effort level of 28,000 boat-days. The best catch of 3644.6 t and CPUE of 120 kg were obtained during 1973-74. Thereafter, the catch and CPUE declined almost continuously coupled with a reduction in the average size of prawns, even though there was a substantial increase in effort, indicating depletion of the stock. *Metapenaeus dobsoni* and *Parapenaeopsis stylifera* contributed to around 85% of the annual average catch of prawns. The annual mean length of males and females of *M. dobsoni* and *M. affinis* and males of *P. stylifera* decreased considerably during the present period of observation compared to earlier years. In the case of females *P. stylifera*, however, the decrease was only marginal.

INTRODUCTION

Information on the prawn resources of the Mangalore area is largely derived from the accounts given by the Department of Fisheries, Mysore (1962), Kuthalingam et al (1966) and Rao (1969). Nagabhushanam et al (1964) and Prabhu et al (1967) gave brief reports based on experimental fishing conducted over short periods. Ramamurthy (1972, a and b) has reported on the trawl fisheries of the South Kanara coast. Later Ramamurthy et al (1975 and 1978) and Ramamurthy (1980) studied the resources of some species of prawns of this area. The fishing pressure on prawns has increased six- to seven-fold over the past two decades, as in other regions. With a view to elucidating further the status of the exploited stocks, the results of investigations conducted at Mangalore from 1970-71 to 1979-80 have been analysed.

COLLECTION OF DATA

Observations were made twice a week at the trawl landing centre at Mangalore for collecting catch statistics. The details of the gear and craft and the methods employed in collecting the catch data have been described by Ramamurthy (1972, a and b) earlier.

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The fishing season starts by early September and lasts till May or early June, there being no fishing during the S.W. monsoon. The main gear employed in catching prawns is trawl net. Generally these nets are operated at depths ranging from 10 to 40 m along the Mangalore coast depending on the availability of prawns.

The details pertaining to the total catch of prawns and effort together with species composition during the different trawling seasons from 1970-71 to 1979-80 are given in Table 1. The fishing effort ranged from 27104 boat-days during 1971-72 to 48812 boat-days during 1976-77. The highest catch of 3644.6 t and catch per unit of effort (CPUE) of 120.9 kg were obtained during 1973-74. The lowest catch of 963.4 t and catch rate of 29.2 kg were recorded during 1979-80.

The relationship between effort and total catch of prawns and CPUE are shown in fig. 1. The data on catch, effort and CPUE relating to the earlier period, i.e., 1962-63 to 1969-70, are also included for this study. It could be seen from Fig. 1 that there was steady increase in effort from 5612 boat-days during 1962-63 to 24354 boat-days during 1968-69 except for a marginal decline during 1963-64. The effort showed a sharp fall by 28.8% during 1969-70 as compared to the previous year and thereafter it steadily increased during the subsequent years, reaching a maximum of 48812 boat-days during 1976-77. Since then the effort showed a declining trend to 32999 boat-days during 1979-80, except for the marginal increase noticed during 1978-79. Together with the effort, the prawn catch also increased from 775.9 t during 1962-63 to an all-time high of 3644.6 t with CPUE of 120.0 kg per boat-day, forming around

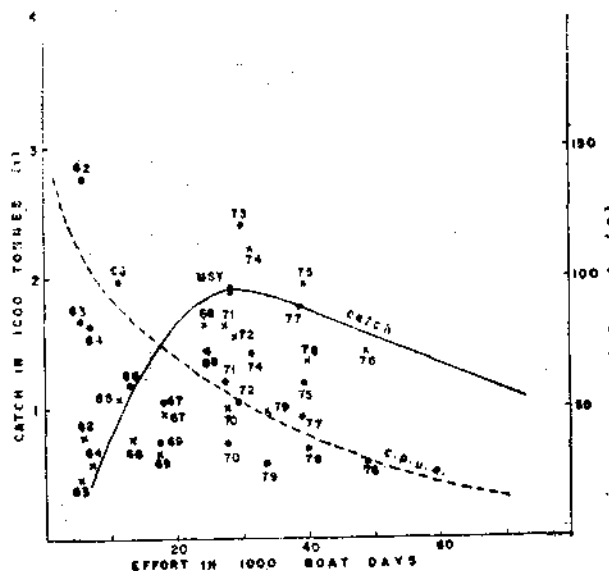


FIG. 1. Relation between effort, catch and catch per unit of effort (in kg).

TABLE 1. Catch in tonnes and CPUE in kg (in parantheses) of the various prawns at Mangalore.

Fishing Season	effort in boat-days	<i>M. dobsoni</i>	<i>M. affinis</i>	<i>M. monoceros</i>	<i>P. stylifera</i>	<i>P. indicus</i>	Others	Total prawns	% in total catch
1970-71	27929	672.1 (24.1)	24.8 (0.9)	1.0 —	192.7 (6.9)	100.8 (3.6)	1.2	992.6 (35.5)	44.1
1971-72	27104	832.2 (30.7)	22.0 (0.8)	—	767.3 (28.3)	5.7 (0.2)	—	1627.2 (60.0)	42.2
1972-73	29020	411.7 (14.2)	29.7 (1.0)	4.3 (0.1)	1107.2 (38.2)	18.4 (0.6)	0.5	1571.8 (54.2)	45.2
1973-74	30149	1780.8 (59.1)	101.6 (3.4)	32.7 (1.1)	1667.6 (55.3)	61.9 (2.0)	—	3644.6 (120.9)	52.2
1974-75	31427	894.8 (28.5)	164.1 (5.2)	1.7 (0.1)	1066.5 (33.9)	102.5 (3.3)	—	2229.6 (70.9)	46.1
1975-76	39406	1158.5 (29.4)	27.5 (0.7)	173.8 (4.4)	448.0 (11.4)	135.5 (3.4)	—	1943.3 (49.3)	48.0
1976-77	48812	216.9 (4.4)	29.4 (0.6)	475.3 (9.7)	542.0 (11.1)	140.5 (2.9)	22.9 (0.5)	1427.0 (29.2)	21.0
1977-78	38602	339.0 (8.8)	95.2 (2.5)	160.2 (4.2)	1089.7 (28.2)	79.5 (2.0)	14.2 (0.4)	1777.8 (46.0)	33.6
1978-79	40418	683.2 (16.9)	54.9 (1.3)	111.3 (2.7)	431.6 (10.6)	80.4 (2.0)	5.4 (0.1)	1366.8 (33.8)	32.0
1979-80	32999	450.0 (13.6)	68.0 (2.0)	65.8 (2.0)	293.7 (8.9)	78.6 (2.4)	7.3 (0.2)	963.4 (29.2)	17.1
Average	34587	743.9 (21.5)	61.7 (1.8)	102.6 (3.0)	760.6 (22.0)	80.4 (2.3)	5.2 (0.1)	1754.4 (50.7)	37.0
% among prawns		42.4	3.5	5.8	43.4	4.6	0.3		

52% of the total trawl catch during 1973-74. Thereafter the catch, as well as the catch rate, was on the decline, except for a rise during 1977-78. Compared to the peak in 1973-74, the catch and the CPUE went down sharply by 73.6% and 76.2%, respectively, within a short span of six fishing seasons. The MSY, based on the smoothening of the curve visually, is estimated to be 1800-1900 t at an effort level of 28000 boat-days. Thus it would be seen that, during 1973-74, the catch has exceeded the MSY and, thereafter, there has been considerable decline both in the catch and the catch rate.

Monthwise catch of prawns together with CPUE for different fishing seasons is shown in Fig. 2, from which it could be seen that the prawn fishery was generally better during January-May and September.

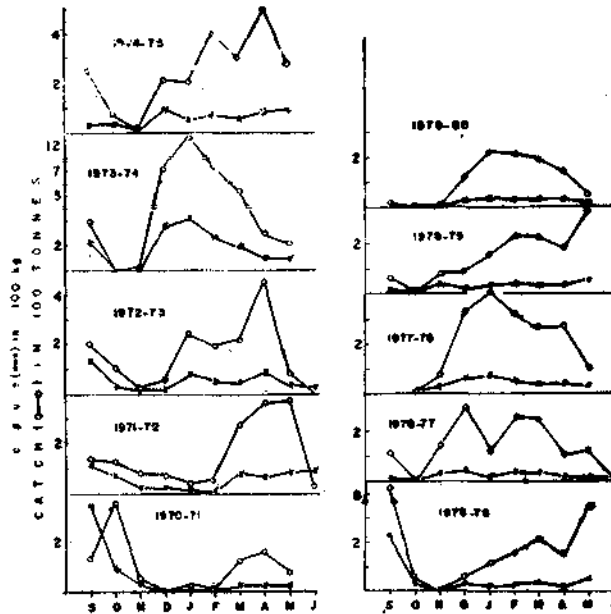


FIG. 2. Monthly variations in the catch of prawns during different seasons.

Species composition

The important species contributing to the fishery were *Metapenaeus dobsoni*, *M. affinis*, *M. monoceros*, *Parapenaeopsis stylifera*, *Penaeus indicus* and *P. monodon*. Of these, *M. dobsoni* and *P. stylifera* together contributed to the bulk of the prawn catch (about 85%) and one or the other species was always found to dominate the fishery.

Prawns like *Penaeus merguensis*, *Parapenaeus longipes*, *Trachypenaeus curvirostris*, *Metapenaeus moyebi* and *Parapenaeopsis acclivirostris* were found to occur in the catches in small numbers during certain periods of the year. *P. longipes* was landed in good numbers during April-May 1980.

of *M. dobsoni* and *M. affinis* and of males of *P. stylifera* decreased considerably during the present period of observation, whereas, in the case of females of *P. stylifera*, the decrease was only marginal and not statistically significant. The reduction in mean lengths of the various species is obviously brought about by over exploitation of the stock over the years.

REMARKS

During the sixties, the effort increased four-fold from 5612 boat-days of 1962-63 to 24345 boat-days of 1968-69. The best catch of 1637.3 t of prawns was during 1968-69 when the effort was at its peak, whereas the highest catch rate of 99.0 kg was during 1965-66 at an effort level of 10788 boat-days (Ramamurthy 1972, a and b). In the course of the present study, the effort showed a further two-fold increase to 48812 boat-days during 1976-77. It is interesting to note that the best catch of prawns (3644.6 t) and catch rate of 120.9 kg was obtained during 1973-74, when the effort was only moderate. Further addition of effort during subsequent years had not resulted in any better yield. On the contrary the catches and the catch rates showed a declining trend, except for an improvement of the fishery during 1977-78. The catch had surpassed the MSY during 1973-74 and, from 1972-73 onwards, the fishing effort also exceeded the optimum level. All these indicate some overfishing in the limited area of operation.

The decrease in the annual mean length of the various species during the present observation is also suggestive of a depletionary trend, since the continuous increase in the effort over the years led to heavy fishing or intensive exploitation of the stock in which the chances of new recruits to grow to larger sizes in the fishing grounds were very much limited. In other words, the prawns were overfished at the virgin level. However, prawns being an annual stock, given a certain measure of control it may not be difficult for itself to replenish, the migrating habits of the prawns, the limited period of the fishing season (September-May) and the operation of trawlers restricted to within 40 m depths all being factors favourable for replenishment.

ACKNOWLEDGEMENTS

The authors express their thanks to their colleagues Dr. M. J. George for his critical comments and valuable suggestions to improve the manuscript and Shri S. K. Dharmaraja for his help in the estimation of MSY.

REFERENCES

- ANONYMOUS., 1962. The development of mechanised fishing in Mysore. *Proc. Indo-Pacif. Fish. Counc.* 12 (II): 64-68.
- KUTHALINGAM, M. D. K., S. RAMAMURTHY, K. K. P. MENON, G. G. ANNIGERI AND N. SURENDRANATHA KURUP. 1966. Prawn fishery of the Mangalore zone with special reference to the fishing grounds. *Indian J. Fish.*, 12(2):546-554.

- NAGABHUSHANAM, A. K., M. D. K. KUTHALINGAM AND S. RAMAMURTHY. 1964. Experimental trawling between Mangalore and Suratkal. *Indian J. Fish.*, 11A (1):181-186.
- PRABHU, M. S., S. RAMAMURTHY, M. D. K. KUTHALINGAM AND M. H. DHULKHED. 1967. On the experimental fishing off Ullal (Mangalore). *Indian J. Fish.*, 14 (1 & 2): 225-231.
- RAO, K. VIRABHADRA. 1969. Distribution pattern of the major exploited marine fishery resources of India. *Bull. Cent. Mar. Fish. Res. Insti.* No. 6: 1-69.
- RAMAMURTHY, S. 1972a. Observations on the mechanised fishery of the Mangalore coast with particular reference to prawns. *Proc. Sem. Mariculture and mech. fishing, Dept. of Fisheries, Madras, Tamilnadu*: pp. 124-129.
- RAMAMURTHY, S. 1972b. Trawl fisheries of the South Kanara coast during 1967-70. *Indian J. Fish.*, 19: 54-59.
- RAMAMURTHY, S., N. SURENDRANATH KURUP AND G. G. ANNIGERI. 1975. Studies on the fishery of the penaeid prawn *Metapenaeus affinis* (Milne Edwards) along the Mangalore coast. *Indian J. Fish.*, 22 (1 & 2): 243-254.
- RAMAMURTHY, S., G. G. ANNIGERI AND N. SURENDRANATHA KURUP. 1978. Resources assessment of the penaeid prawn *Metapenaeus dobsoni* (Miers) along the Mangalore coast. *Indian J. Fish.*, 25 (1 & 2): 52-66.
- RAMAMURTHY, S. 1980. Resource characteristics of the penaeid prawn *Parapenaeopsis stylifera* (Milne Edwards) in the Mangalore coast. *Indian J. Fish.*, 27 (1 & 2): 161-171.