A BRIEF OBSERVATION ON THE JUVENILE PRAWN FISHERY OF KILLAI BACKWATERS IN THE CAUVERY DELTA

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ABSTRACT

The stake-net fishery has revealed that the juvenile prawns enter the backwaters in two annual waves, in July September and December-January, coinciding with moderate inflow of freshwater. *P. indicus* (44.4%), *M. monoceros* (33.7%) and *M. dobsoni* (15.9%) were the dominant components of the fishery. Their modal lengths were respectively 55-110 mm, 50-95 mm and 35-65 mm, and the estimated monthly growth-rates for females while in the backwaters were 19.9 mm and 17.9 mm, 12.6 and for males 9.7 mm and 10.5 and 9.3 mm.

INTRODUCTION

A study of the juvenile fishery of Killai backwater would add to the knowledge of the prawn resources of the Cauvery base, which is being commercially exploited in recent years. Though the hydrobiological features of this backwater are known to some extent (Venugopal 1972 and Sundararaj and Kishnamoorthy 1973), the knowledge of the prawn fishery is restricted to the brief work of Evangeline et al. (1975). The present study, which forms part of the investigations under the 'All India Co-ordinated Research Project for Studies on Marine Prawn Resources and Biology', furnishes some information about species composition, and seasonal trend in the fishery of the backwater.

MATERIAL AND METHODS

Fortnightly samples were collected from July 1972 to December 1973 from Thonithorai, one of the three landing centres on the backwater. Each observation day, catches of prawns were estimated of a few units at random and, by raising its average to the number of fishing days, the month's totals were estimated. The same method was followed in the estimations of the different species also.

The samples of *Penaeus indicus, Metapenaeus monoceros* and *M. dobsoni* were further analysed for sex and total length. Corresponding size-modes in successive monthly length-frequency distributions were linked as mode-chains to determine the growth rate.

Fishing was throughout the year with intermittent disruptions due to monsoon floods. Though gill-net was also used, the observation was limited to the stake-net, the main gear operated for prawns. The stake-net is a bag-net, having an oblong mouth kept open by vertical sticks fastened to the mouth-ropes, and generally operated at night by tying to erected stakes.

Hydrobiological Features of the Backwater

Killai backwater, the main constituent of the extensive Vellar-Coleroon estuarine complex of Cauvery deltaic region, consists of numerous creeks and rivulets interlacing through dense mangrove jungle with uninterrupted wide connections to the sea. In addition to the thick debris from bushes and shrubs fringing the channels, this backwater receives nutrients through copious flow of freshwater discharges from extensive paddy fields on the hinterlands. The reported hydrographical readings for this backwater are: depth 32-154 cm; temperature 24-33°C; salinity 2.7-34.1‰ and dissolved oxygen 2.93-6.30 ml/l during the year 1970-71 (Sundararaj and Krishnamoorthy 1972). The cyclone which hit this region in December 1972 flooded the coastal areas, changing the whole ecosystem for several days.

Fishery

The number of fishing units (Table 1) operated was largely dependent on fishing success. The monthly effort varied between an estimated 310 units in October 1973 and 2100 units in April 1973, with an overall average of 977 units. Relatively few units were operated in October-November, owing to monsoon floods disrupting fishing operation.

The monthly catch of juvenile prawns, which contributed nearly 48% of the total stake-net catches, varied between 0.33 t in October 1972 and 9.0 t in January 1973, with an average of 3.5 t, at CPUE of 3.2 kg/unit/day. The fishery showed two annual waves, in July-September and December-January, coinciding with the pre- and post-monsoons.

The fishery was moderate with the catch rate exceeding 4.0 kg/unit/day during July-August 1972, when the paddy cultivation was active over the extensive hinterlands. The poorest catch of 0.96 kg/unit/day noted in October improved later, from December, and reached the maximum of 6.11 kg/unit/day in January 1973, and then declined to 1.38 kg/unit/day in Februrary. Then on the catch remained poor. This trend was more or less followed in 1973 also (Table 1). The percentage contribution of prawns in the stake-net catches varied between 18.2% in October 1972 and 88.3% in December 1973 with an overall average of 47.9%.

TABLE 1. *Details on Total Catch, Effort, Percentage and CPUE of prawns for the stake net landings at Thonithorai (Killai).*

	No. of units	Catch (kg)	CPUE (kg/unit/day)	Percentage
1972				
July	1550	6847.1	4.42	38.8
August	1318	5641.7	4.28	31.0
September	825	2490.2	3.02	30.0
October	682	326.7	0.96	18.2
November	820	2904.8	3.54	81.3
December	640	2542.7	3.97	75.2
1973				
January	1473	8996.8	6.11	73.4
February	700	483.1	1.38	24.2
March	744	1696.6	2.28	41.2
April	2109	3262.2	3.11	59.2
May	419	961.0	2.27	29.4
June	495	1225.5	2.48	33.1
July	853	3022.2	3.54	28.2
August	1488	7789.4	5.24	42.4
September	1170	3540.6	3.02	47.2
October	310	573.4	1.85	43.0
November	975	1428.6	1.47	44.8
December	1473	8835.5	6.00	88.3
Average	997	3476.0	3.27	47.9

SPECIES COMPOSITION

The stake-net fishery was mainly consitituted by *P. indicus*, *M. monoceros* and *M. dobsoni*, together forming 90% of the catches. Among these *P. indicus* was the most abundant (44.4%) with an average monthly landings of 1.5 t. The catch rates of *M. monoceros* and *M. dobsoni* were 1.2 t and 0.6 t respectively. *P. monodon*, *P. semisulcatus*, *P. merguiensis*, *P. canaliculatus*, *P. japonicus*, *M. affinis*, *M. brevicornis*, *M. malcolmsoni* and *Macrobrachium rosenbergii*

were also present in the catches in minor proportions. Among these, *P. monodon* and *P. semisulcatus* were commercially valuable species caught at a rate of 0.15 t and 0.05 t, respectively, per month.

The catch of *P. indicus*, (Fig. 1) which ranged between 0.09 t in February 1973 and 4.7 t in January 1973 had two peak seasons, July-September and November-January. Similarly, the fishery of *M. monoceros* also recorded two peak seasons, in July-September and December-January, the highest catch being 3.83 t in December 1973 and poorest 0.08 t in May 1973. But the fishery season of *M. dobsoni* showed a slight annual variation. The peak, which was recorded in August-September during 1972, was in November-January in 1973, and the monthly catch of this species varied between 0.01 t in October 1972 and 1.17 t in December 1973.

Length-frequency

P. indicus: The size of this species (Fig. 1) ranged between 31 mm and 130 mm. There was a slight size variation between the sexes, the females being generally larger. The monthly size-frequency distribution was bimodal. The mode which was at 58 mm in July 1972 could be traced till September, when it reached 103 mm. Another mode which appeared in December 1972 at 55 mm for both sexes advanced to 108 mm in the case of female and 103 mm in the case of male in April 1973. A third mode at 55 mm for both sexes in April could be traced till July, when it reached 108 mm in the case of female and 103 mm in the case of male (Fig. 1). From these progressions the average growth rate of the species could be fixed at 19.9 mm/month in the case of female and 17.9 mm/month in the case of male.

M. monoceros: The sizea range of the species in the catches was 31-110 mm. The size frequency distribution was mostly bimodal, and each mode could be traced for 2-3 months. A dominant mode at 58 mm for both sexes in July 1972 progressed to 83 mm in the case of males and 88 mm in the case of females in October. Another mode which appeared meantime in September at 53 mm for both sexes progressed to 83 mm in the case of males and 88 mm in the case of females. Yet another mode at 48 mm for either sexes in June progressed to 93 mm in the case of females and 88 mm in the case of males in September. Based on these modal progressions (Fig. 2) the average growth-rate of the species was estimated at 12.64 mm/month in female and 11.76 mm/month in male.

M. dobsoni: The size of the species (Fig. 3) varied between 31 mm and 75 mm, with one or two modes in each month. The modal-size at 38 mm for both sexes in August 1972 was traced to 53 mm in the case of males and 58 mm in case of females in October. Another mode at 38 mm for both sexes traceable

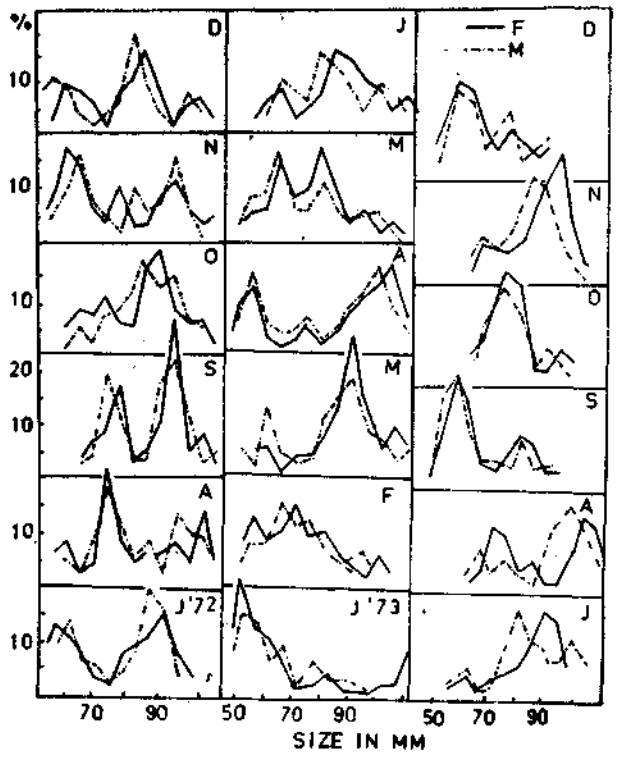

FIG. 1. Length frequency of *P. indicus*.

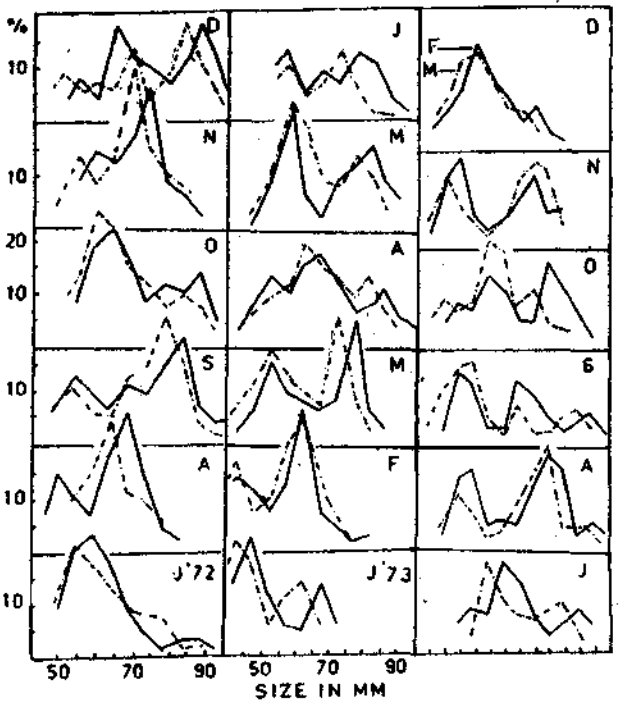

FIG.2. Length frequency of *M. monoceros*.

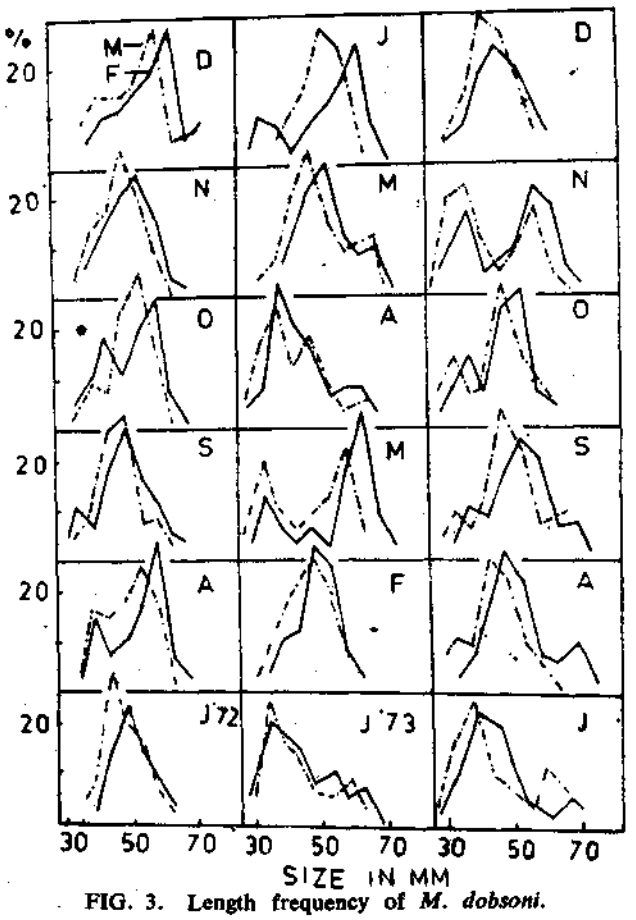

FIG. 3. Length frequency of *M. dobsoni*.

till December, when it reached 58 mm in the case of males and 63 mm in the case of females. A third mode that appeared in January 1973 at 33 mm for both sexes had reached 63 mm in the case of males and 68 mm in the case of females in May. A fourth mode at 33 mm in July for both sexes increased to 63 mm in the case of males and 68 mm in the case of females in November.

Thus, the recruitments of this species into the backwaters were continuous with intermittent peaks. The growth-rates, as based on modal-size progression, were estimated at 10.5 mm and 9.7 mm/month for females and males, respectively.

General Remarks

Several local factors appear to support the good juvenile population of prawns in this backwater, such as the mangrove swamps with thick vegetations, the deltaic waters rich with silts and fertilizing effects from the extensive paddy

fields. In addition, the wide bar-mouth openings ensure to and fro movements in all seasons. Similar nursery conditions have been reported to be favourable to prawns also by Rajyalakshimi (1973) and Young (1978). The annual fluctnation characterized by two peaks appears to be effected by the N.E. monsoon around October-November and acute summer conditions in April-May. Moderate runouts from paddy fields in July-August and the post-monsoon silts and the impact of paddy farming in the hinterlands in December-January seem to favour the production of prawns. Similar correlation between abundance of prawns in nurseries and freshwater discharges has been observed by Menon and Raman (1961) and Rajyalakshimi (1973). Considering the size range and the modal progressions, these species apparently spend 4-5 months in the backwaters, which is in contrast to the period reported by Menon (1955) and Menon and Raman (1962), who have stated that *P. indicus* might live for about a year in backwaters.

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