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## EXPERIMENTS ON THE CULTURE OF *PENAEUS INDICUS* IN POLYETHYLENE FILM-LINED PONDS AT CALICUT\*

The possibilities of converting extensive areas of sandy shores into productive aquaculture ponds by providing polyethylene film-lining have been reported by Mohan and Nandakumaran (*Mar. Fish. Infor. Serv., T & E Ser., No. 26: 6-8, 1980 and Proc. Symp. Coastal Aquaculture, 1: 409-412, 1982*) based on the experiments conducted at Calicut by the Central Marine Fisheries Research Institute. Following the above study another set of experiments were conducted from April to September, 1981 with the seeds of the prawn *P. indicus*, produced at the Narakkal Prawn Culture Laboratory of the Institute and transported to Calicut in oxygen filled bags. The average length of the seed was 18 mm. They were stocked in three polyethylene film-lined ponds viz., ponds A (192 m<sup>2</sup>), B (63 m<sup>2</sup>) and C (123 m<sup>2</sup>) at stocking densities of 14.6, 38.0 and 30.5 /m<sup>2</sup> respectively on 25-4-1981. Some of the seed were grown separately in a nursery and when they attained an average size of 46.6 mm and 84 mm they were stocked in ponds D and E (70 m<sup>2</sup> each) at densities of 6.4/m<sup>2</sup> and 7.1/m<sup>2</sup> respectively on 12-5-1981 and 23-7-1981.

Sample measurements of length and weight of the stocked prawns were taken once in a fortnight. Environmental parameters such as salinity and dissolved oxygen were estimated weekly and also at the time of taking prawn sample for measurements. Temperature was noted twice daily at 10 A.M. and 3 P.M. Pelleted prawn feed (proximate composition: crude protein 30.68%, lipid 3.40%, ash 22.55%, carbohydrate 41.27% and moisture 2.10%) prepared at the Narakkal Prawn Culture Laboratory of the CMFRI was given as food up to the second week of August at a rate of 10% of the body weight. Afterwards the prawns were fed at the same rate with moist dough made out of equal quantities of wheat powder, coconut oil cake, rice and fish meal, as the feed from the above laboratory was not available for feeding. The stocking details, environmental data and the results obtained are given in Table 1.

Temperature ranged between 27.3° and 35.5°C and the maximum was observed in pond D during May and

**Table 1.** Stocking and harvest details of *P. indicus* and the environmental data

Particulars	Ponds				
	A	B	C	D	E
Area of pond (m <sup>2</sup> )	192	63	123	70	70
Date of stocking	25-4-81	25-4-81	25-4-81	12-5-81	23-7-81
Date of harvest	5-9-81	18-8-81	17-8-81	18-7-81	8-9-81
Duration of the experiment (days)	133	115	114	67	47
Mean length at stocking (mm)	18.0	18.0	18.0	46.6	84.0
Mean weight at stocking (g)	0.1	0.1	0.1	0.7	3.6
No. stocked	2,800	2,400	3,750	450	500
Stocking density (no./m <sup>2</sup> )	14.6	38.0	30.5	6.4	7.1
No. harvested	535	190	134	390	449
Survival rate (%)	19.1	7.9	3.6	86.7	89.8
Count per kg	160	76	108	100	145
Mean length at harvest (mm)	102.1	124.3	111.8	116.0	100.9
Mean weight at harvest (g)	6.6	13.3	10.1	10.4	6.9
Daily length increment (mm)	0.60	0.92	0.82	1.02	0.35
Daily weight gain (g)	0.05	0.11	0.09	0.14	0.07
Temperature (range in °C)	28.1-34.3	27.3-35.3	28.9-34.3	29.0-35.5	29.2-31.8
Salinity (range in ppt)	1.1-29.4	4.2-25.8	5.8-28.7	6.0-29.3	11.8-31.1
Dissolved oxygen (range in ml/l)	3.0-4.8	4.0-4.8	3.5-5.6	3.2-4.7	3.7-4.7

\*Prepared by S. Lazarus & K. Nandakumaran, Calicut Research Centre of CMFRI, Calicut and K. H. Mohamed & M. S. Muthu, CMFRI, Cochin.

the minimum was recorded in pond B in August. In general the temperature was high during April–May period and low during June–August period. Salinity had a high range of fluctuation in the ponds. It varied from 1.1 to 31.1 ppt, and the minimum was observed in pond A and the maximum in pond E. Though salinity in the ponds ranged between 18.3 and 29.3 ppt in April/May except in pond E, it started declining towards the end of May due to the onset of monsoon and reached a low value at the end of June. Dissolved oxygen level varied within a narrow range of 3.0–4.8, 4.0–4.8, 3.5–5.6, 3.2–4.7 and 3.7–4.7 ml/l in ponds A, B, C, D and E respectively. Normally the low values were observed towards the end of the experiment.

Good growth rate was seen in pond D where the stocking density was 6.4/m<sup>2</sup> (Fig. 1). The mean size (46.6 mm) of the prawn on stocking was also high when compared with other ponds in which it was 18 mm except pond E in which it was 84.0 mm. Comparatively better results were obtained in pond B and C. In pond B rapid growth was observed upto the 32nd day with an average daily increase of 1.7 mm. Afterwards it was only 0.6 mm per day which was much less than the average for the pond. But weight increment was very slow up to the 17th day and afterwards the increase was steady till the 105th day. In pond C also an almost similar trend was observed except that the weight remained stationary from 75th to 89th day and then increased again. The length increase was rapid during the first 17 days and thereafter it slowed down very gradually. In pond A the overall performance of the prawns was poor when compared to the prawns in the other ponds. The growth rate and weight increment observed were respectively 0.86 mm and 0.47 g per day upto 75th day of the experiment and from 89th to 121st day they were 0.55 mm and 0.1 g. The mean size and mean weight were found to be stationary at 84 mm and 3.6 g respectively from 75th day to 89th day.

The foregoing observations clearly show that stocking density plays an important role in the growth of prawns cultured in the polyethylene film-lined ponds. In pond D where the stocking density was less, the growth was

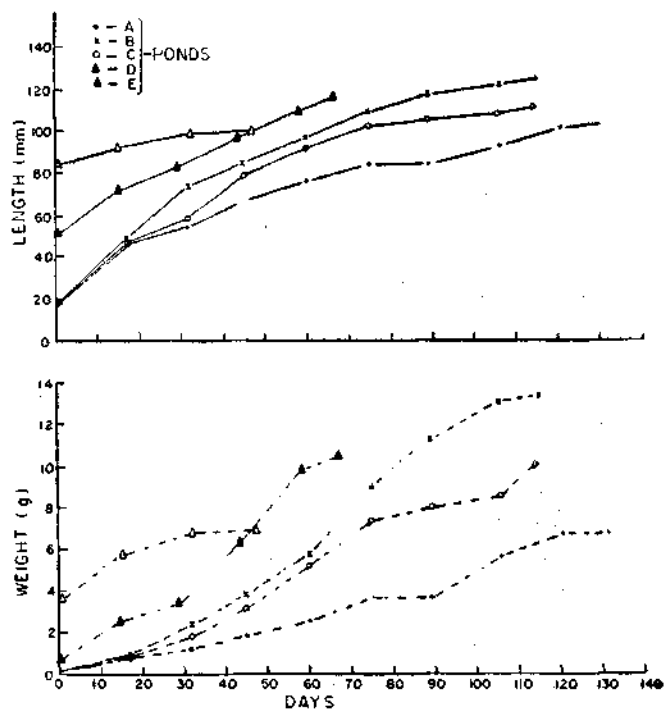


Fig. 1. Growth of *P. indicus* in the different ponds.

observed to be very good. The fast growth rate found in pond B and C may be due to high initial mortality of the fry soon after their stocking thereby thinning the population. This is further evidenced by the low survival rate and better size of the prawns at harvest observed in these two ponds.

The above experiments also show that the size at stocking has a bearing on the survival rate of the prawns. In ponds A, B and C the prawns were stocked at a smaller size (18 mm) and the survival rates were respectively 18.4%, 7.9% and 3.6%. But in pond E the stocking size was 46.6 mm and in pond D it was 84.0 mm and the survival rates were respectively 86.7% and 89.8%. The greater survival rates in ponds E and D could also be due to the shorter duration of the experiment in these ponds, where the prawns were reared for only 67 and 47 days respectively. In ponds A, B and C the prawns were kept for more than 100 days. Along with good survival rates, ponds D and E yielded good harvests (Table 1).

