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## CULTURE OF FISHES IN POLYTHENE LINED PONDS\*

Experiments have proved that prawns and fishes can be cultured in the unproductive sandy sea shore by lining the ponds suitably with black polythene film. (Lal Mohan and Nandakumaran, 1981 *Mar. Fish. Infor. Ser. T & E Ser. No. 26*). Further experiments indicate the possibility of culturing milk fish and pearl spot in this type of ponds, the results of which are presented here.

### Chanos chanos

The milk fish fingerlings of length of 82 mm weighing 3.5 g were stocked on 8-8-1980 in a 0.025 ha pond at the rate of 5600/ha i.e., 140 numbers in the pond. During the first 70 days of stocking the fishes grew about 1 mm/day. The weight increment during the period was 0.42 g/day. Salinity was low during the period ranging between 0.4 to 4.7 ppm. During the next 45 days the fishes registered a growth of 2.1 mm/day and the weight increase was 1.5g/day when the salinity ranged between 1.7-25.7 ppm. The milk fish attained very good growth in this brackish water condition. A growth of 0.7 mm/day and increase in weight of 1.0 g/day was noticed during the ensuing three months when the salinity varied between 29.0-39.4 ppm (Table I).

The production rate for the first 3 months was 320 kg/ha; at the end of 6 months 880 kg/ha; and when

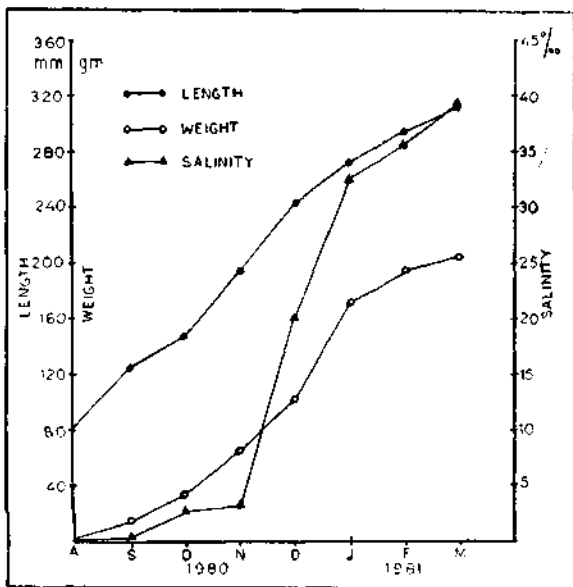


Fig. 1. Growth of *Chanos chanos* in a polythene lined pond at Calicut.

it was harvested after 7 months it was 920 kg/ha. It may be seen that the growth of chanos is faster during the first 6 months (Fig. 1).

The fishes were fed with a compounded feed prepared by boiling broken wheat, dry fish and sardine oil mixed at the ratio of 100:10:1. The food was given daily at a rate of 1/10 of the body weight of the stock. The food contained 7.5% protein, 4.8% fat

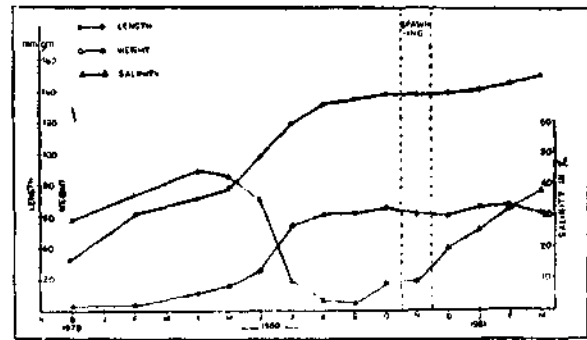


Fig. 2. Growth of *Etroplus suratensis* in a polythene lined pond at Calicut.

and 77.8% moisture. The fishes were observed to feed on it voraciously. This food, in addition to being cheap and easy to prepare even by the fishermen, does not dissolve and spoil the water.

The water qualities were tested daily and the temperature inside the ponds varied between 24.5 and 39.0 C. Dissolved oxygen and salinity of the pond ranged between 1.9-6.6 ml/l and 0.4 to 39.4 ppm respectively. The pond had a very good growth of phytoplankton like *Thalassiosira* spp., *Coscinodiscus* spp., *Merismopodia* spp., *Microcystis* spp. etc.

Final harvest after 7 months was 23 kg of chanos (numbering 120 fish) from a 0.025 ha pond, giving a production rate of 920 kg/ha for 7 months. The survival rate was 86%. The cost economics of the culture experiment is shown in Table 3.

### *Etroplus suratensis*

In December 1979 *Etroplus* (pearl spot) fingerlings measuring 30 mm weighing 1.0 g. was stocked in another pond of area 0.025 ha at the rate of 8400/ha. i.e., 210 numbers in the pond. The water conditions

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and feed used were more or less similar to the previous experiment.

The monthly increment of length and weight were slow when compared to the milk fish (Fig. 2). During the first 6 months the monthly increase of length was 8 mm and the weight increment was 2.3 g. Salinity of the pond was high during the period ranging from



Fig. 3. Portion of the harvest of *Chanos chanos* after 7 months from a 0.025 ha polythene lined pond.

24.9–47.3 ppm. During the next 3 months from June to August the growth was 18 mm/month with an increase in weight of 15.5 g/month, showing a much higher



Fig. 4. Portion of the harvest of *Etroplus suratensis* after 15 months from a 0.025 ha polythene lined pond.

growth rate compared to the previous 6 months (Table 2). Due to monsoon the salinity of the pond got reduced from 47.3 to 3.2 ppm.

The growth of the fishes was very slow during the next 7 months which included the breeding season of the fish. The growth was only 2.6 mm/month and the weight increase was only 0.29 g/month (Fig. 2). Salinity during the period ranged from 0.8–38.3 ppm. *Etroplus* was found to breed during November after one year of stocking when salinity rose to 9.9 ppm. However to facilitate spawning, laterite stones and

Table 1. Observations on the growth of *Chanos chanos* in a 0.025 ha polythene lined pond.

Date (Month)	Length (Mean) mm	Weight (Mean) g	Salinity (Range) ppm	Oxygen (Range) ml/l	Temp. °C (Range) °C
*August (1980)	82	3.5	0.7–1.0	4.3–5.9	27.4 (25.0–32.0)
September	124	16.9	0.4–0.8	4.6–6.6	28.5 (25.0–32.0)
October	148	33.0	2.4–4.7	2.7–5.3	28.5 (24.5–32.0)
November	196	67.0	1.7–5.3	3.2–4.5	29.5 (26.0–39.0)
December	243	103.0	18.6–25.7	1.9–5.2	29.3 (26.0–33.0)
January	277	173.0	29.0–34.4	2.7–4.0	29.5 (25.0–34.0)
February	294	182.0	33.3–39.4	3.9–5.2	29.0 (27.0–34.0)
March	310	202.0	38.4	4.1	29.5 (26.0–34.0)

\* Stocking date 8–8–1980; seeds from the low lying area adjacent to the fish farm.

**Table 2.** Observations on the growth of *Etroplus suratensis* in a .025 ha polythene lined pond.

Date	Length (Mean) mm	Weight (Mean) g	Salinity (Range) ppm	Oxygen (Range) ml/l	Temp. °C (Mean) range °C
December '79	30	1.0	24.9-26.1	1.6-4.3	27.1 (25.0-29.0)
February '80	61	6.1	34.5-34.9	3.5-6.0	29.5 (27.0-32.0)
April	74	11.5	41.0-47.2	3.4-4.3	30.8 (25.0-36.0)
May	78	14.8	33.7-47.3	0.7-3.3	32.0 (29.0-36.0)
June	100	25.5	8.1-37.2	2.2-4.9	28.1 (24.0-34.0)
July	120	57.0	3.8-6.3	2.9-4.9	26.6 (24.0-30.0)
August	132	61.2	3.2-4.6	4.4-6.5	26.9 (25.0-31.0)
September	135	61.2	0.8	5.4-5.5	28.6 (26.0-31.0)
October	138	65.7	6.7-11.4	3.0-6.4	27.6 (25.0-32.0)
November*	138	61.5	7.4-12.3	2.5-6.7	29.6 (25.0-35.0)
December	138	60.8	16.8-22.9	2.3-5.5	29.4 (26.5-33.0)
January '81	141	66.7	26.9-32.1	1.7-3.8	29.0 (27.5-33.0)
February	145	66.4	30.5-36.0	2.6-3.6	29.5 (27.0-33.5)
March	150	62.6	38.3	3.6	30.0 (26.0-35.0)

\* Spawning

floating bamboo reapers were provided as substrata for the eggs. There was good growth of filamentous algae in the ponds during October to March.

The production rate was 372 kg/ha for the first 9 months. After this period the growth was very slow and the fishes have grown from 138 to 150 mm and weight increment was almost nil. Hence it is better to harvest *Etroplus* after 8-9 months. If spawners and seeds are required they can be kept longer.

After about 15 months 9.5 kg of *Etroplus* was harvested. The production rate works out to 380 kg/ha,

which is much lower than that of *Chanos chanos* obtained in the other experiment. The survival rate at the end of 15 months was found to be 72%, which also is lower than *Chanos*. Economics of operation showing the inputs and yield is shown in Table 3.

From these results it would appear that farming the milkfish is much more economical than that of pearl spot in these polythene-lined ponds. However, more data based on large scale operations is needed from these ponds before the economic viability of the culture system is evaluated.

**Table 3. Economics of fish culture in polythene lined ponds ( Pond area .025 ha)**

Expenditure	Rs. Ps.	Income	Rs. Ps.
<b>1. Species: <i>Chanos chanos</i></b>			
i) Cost of polythene film (@ Rs. 3.50/sq.m. for 250 sq.m.) Sheet can be used repeatedly	875.00	Sales of fishes @ Rs. 7.50/kg for 23 kg (920 kg/ha/7 months)	172.50
ii) Cost of digging :	800.00		
Recurring expenses :			
1. Food			
(23 kgs of broken wheat @ 0.80/kg: Rs. 18.40)	30.15		
2.3 kgs of dry fish @ 3.50/kg: Rs. 8.05			
230 ml of sardine oil @ Rs. 16/kg: Rs. 3.68			
2. Pumping charges			
" Rs. 3.10/hr for 15 hrs	46.50		
Total (Recurring)	76.65 (Rs. 3066/ha)		172.50 <u>(Rs. 6900/ha)</u>
<b>2. Species: <i>Etrophus suratensis</i></b>			
i) Cost of polythene film (Details as above)	875.00	Sales of fishes @ Rs. 10.00/kg for 9.5 kgs. (380 kg/ha/15 months)	95.00
ii) Cost of digging	800.00		
Recurring expenses:			
1. Food			
42 kgs of broken wheat @ Rs. 0.80/kg; Rs. 33.60	54.70		
4.2 kgs of dry fish @ 3.5/kg: Rs. 14.70			
400 ml of sardine oil @ Rs. 16/kg: Rs. 6.40			
2. Water pumping charges			
@ Rs. 3.10/hr for 15 hrs	31.00		
Total	85.70		95.00
Recurring expenses	(Rs. 3428/ha)		<u>(Rs. 3800/ha)</u>

A colour film in English entitled 'Mariculture' is available at a cost of Rs. 3,500/- for 16 mm print and Rs. 6,160/- for 35 mm print. For further details please contact Films Division, Ministry of Information and Broadcasting, Government of India, 24, Dr. G. Deshmukh Marg, Bombay-400 026.