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Part Two

MARCH 1990



## **NATIONAL SYMPOSIUM ON RESEARCH AND DEVELOPMENT IN MARINE FISHERIES**

**MANDAPAM CAMP**  
16-18 September 1987

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Papers Presented  
Sessions III & IV

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**CENTRAL MARINE FISHERIES RESEARCH INSTITUTE**  
(Indian Council of Agricultural Research)  
P. B. No. 2704, E. R. G. Road, Cochin-682 031, India

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**Limited Circulation**

## REARING OF POST-LARVAE OF *PENAEUS MONODON* IN NURSERY POND-AN EXPERIMENTAL STUDY

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### ABSTRACT

In the present experiment, Postlarvae of *Penaeus monodon* received from M/s Hindustan Lever Hatchery, Muttukkadu were reared in a nursery pond at Porto Novo. In a span of one month, they were reared to the stockable size of 30 to 48 mm (average size 38 mm) from an initial size of 8 to 12 mm (average size 10 mm). Pond was suitably prepared after the application of cowdung. Coconut and palm leaves were fixed at the sides of the pond to avoid the direct heat of the sun and evaporation. Clam meat (*Meretrix* sp.) was used as the supplementary feed at 100% body weight. Hydrographical conditions of the pond waters in relation to length and weight (growth) have been discussed. About 98% recovery was achieved.

### INTRODUCTION

The prawn seed produced in hatcheries in the post-larval stage are to be reared in nurseries before stocking them in grow out ponds. One of the most important steps in prawn culture is the nursery management and successful prawn farming depends on efficient nursery management (Siddharaju *et al.*, 1980). Experimental studies with hatchery produced prawn seeds in nurseries will go a long way in evolving successful nursery management strategies. Therefore in the present study, nursery management of hatchery produced seed of *Penaeus monodon* was considered.

### MATERIAL AND METHODS

Postlarvae of *P. monodon* received from M/s Hindustan Lever Hatchery, Muttukkadu were reared in an earthen nursery pond. The nursery pond (0.015 ha) was suitably prepared after the application of cowdung at the rate of 1000 kg/ha. The inlet pipe was tied with P-40 mesh veilon screen material of bag type to avoid the entry of any unwanted fish and easy flow of water. Apart from natural exchange of water during the high

tide, pumping of water from the feeder canal was resorted to whenever necessary. Coconut and palm leaves were fixed at the sides of the pond to avoid direct heat from the sun and evaporation.

Stocking density tried was 10,200 nos. per pond (6,80,000 nos/ha). Clam meat (*Meretrix* sp.) was used as the supplementary feed at the rate of 100% total body weight in the evening hours of the day after boiling and chopping the flesh. Environmental factors like temperature, salinity, dissolved oxygen and pH were recorded during the rearing period. Random sampling of 50 post-larvae was made once in 15 days for growth assessment. Harvesting was done at the end of 30 days and the percentage of survival and growth rate were recorded.

### RESULTS AND DISCUSSION

The initial average length and weight recorded were 10 mm and 4 gm respectively, (size range 8 to 12 mm). The hydrographical conditions in the nursery as well as in the nearby Vellar estuary are given in Table 1. During the rearing period, temperature of

Table 1. Hydrographical conditions of pond waters during the rearing period.

Date of sampling: 15-5-1985

Ponds	water temp.	pH	Depth	Salinity	Oxygen
Nursery pond	33.5°C	8	63 cm	34.1‰	4.17 ml/litre
Vellar estuary	33°C	8	—	31.60‰	5.64 ml/litre

Date of sampling: 30-5-1985

Nursery pond	32°C	7.6	72 cm	34.6‰	4.75 ml/litre
Vellar estuary	32°C	7.5	—	34‰	6.42 ml/litre

Date of sampling: 14-6-1985

Nursery pond	32.5°C	8	60 cm	33.6‰	4.92 ml/litre
Vellar estuary	32°C	8	—	34‰	5.12 ml/litre

water ranged from 32 to 33.5°C, salinity from 33.5 to 34.1‰, pH from 7.5 to 8.0 and the dissolved oxygen from 4.17 to 4.92 ml/l. Other details such as survival and growth are also given in the Table 2.

Table 2: Stocking particulars of postlarvae of *P. monodon* in Nursery pond.

Particulars	Rearing of PL 20 <i>P. monodon</i> in nursery pond
Pond area	0.015 ha
Date of stocking	15-5-1985
Species reared	<i>P. monodon</i>
Nos stocked per pond	10,200 nos
Rate of stocking	6.8 lakhs/ha
Initial length	10 mm
Initial weight	0.004 g
Supplimentary feed used	Clam Meat ( <i>Meretrix</i> sp.)
Rate of feeding	100%
Final average length	38 mm
Final average weight	0.520 g
Date of harvest	14.6.85
Total nos. of juveniles recovered	10000
% of recovery	98.04%
Duration of experiment	30 days

After 15 days, samples were collected at random and the average length and weight were recorded as 32.75 mm and 290.3 mg respectively. In a span of 30 days they have grown to the stockable average size of 38 mm (size range 30 to 48 mm) and its average weight was 0.52 g. Out of the 10,200 numbers stocked 10,000 nos were recovered, recording about 98% recovery. These were stocked in bigger ponds for further growth.

This result is quite significant when viewed against 31 to 68% survival rate at Kovalam (Siddharaju *et al.*, 1980). Earlier it was reported (Bose and Venkatasamy, 1978) that for well prepared nursery ponds, the suitable stocking densities could be from 2 to 3 lakhs/ha. But the survival rate reported here was low and varied from 30 to 40%.

Under controlled conditions in the plastic pools with artificial feeding, postlarvae of *Penaeus monodon* reared at an initial stocking density of 10,000/m<sup>2</sup>, thinned twice to half the number at fortnightly intervals, a survival of 75% in a total period of 60 days of rearing was achieved with final size of 45-50 mm (Verghese, 1978).

In another experiment conducted in plastic pools postlarvae of *P. monodon* reared

without artificial aeration but with partial daily renewal of water and regular artificial feeding showed 59 to 73% survival rate at stocking densities 1000 nos/m<sup>2</sup> and 1500 nos/m<sup>2</sup> respectively. But the average weight obtained in this was from 19.5 to 20 mg (Alikunhi *et al.*, 1980).

But in the present study with stocking density of 6.8 lakhs/ha, higher survival rate was found and the results are quite comparable to the survival rate of 94% in closed raceway systems (Mock *et al.*, 1973).

Survival rate of prawns depends on stocking density as well as stocking size (Ravichandran *et al.*, 1980). It has been suggested by Siddharaju *et al.* (1980) that nylon cages could successfully be utilised as nurseries for rearing of prawn larvae. But the present study proves that nursery ponds are better than the cages for the rearing of postlarvae.

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#### REFERENCES

- ALIKUNHI, K. H., K. K. SUKUMARAN AND S. ADI SUKRESNO, 1980. Notes on postlarval rearing of Penaeid shrimps. *Proceeding of First National Symposium on shrimp farming*, 89-90.
- BOSE, V. C. AND A. D. VENKATASAMY, 1978. *J. Inland. Fish Soc. India*, 8: 163-167.
- MOCK, C. R., R. N. NEAL AND SALSER, 1973. A closed raceway for the culture of shrimp. *Proc. Annu. workshop, world Mariculture Soc.*, 4: 247-259.
- RAVICHANDRAN, P., P. U. VERGHESE, H.C. KARMAKAR AND T. RAJYALAKSHMI, 1980. Effect of stocking density and size on *Penaeus monodon* (Fabricius) postlarvae in nursery rearing experiments. *Proceedings of the Symposium on coastal aquaculture Part I. Prawn culture*, 412-413.
- SIDDHARAJU, S. K. M. MD. SULTAN AND V. RAMACHANDRA MENON, 1980. Nursery rearing of Postlarvae of two commercially important penaeid prawns in Nylon cages. *Proceedings of the Symposium on coastal aquaculture, Part I. Prawn culture*, 403-405.
- VERGHESE, P. U., 1978. Potentials of brackish-water prawn culture in India. *Proceedings of the First National Symposium on shrimp farming*, 189-203.