

## STUDIES ON THE CULTURE OF *HETEROPNEUSTES FOSSILIS* IN CAGES

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### ABSTRACT

Growth of *singhi*, *Heteropneustes fossilis* in cages made of bamboo ( $1 \times 1 \times 1$  m) and net ( $2 \times 1 \times 1$  m) was studied keeping a constant water level of 35 cm. The stocking density of both the cages was 50 nos/m<sup>2</sup>. Artificial pelleted feed prepared from trash fish as the main ingredient was used for feeding the fishes. The growth increment observed during the experimental period of 112 days was 23.1g in bamboo cages while in net cages it was only 21.5g. The survival rate ranged from 72 to 84%. The bamboo cages were cheap and found to be suitable for the economic cultivation of *H. fossilis*. A few useful techniques for enhancing fish production in cages are discussed.

### INTRODUCTION

Emphasis is being given now a days to increase the unit area production by way of improved intensive culture methods. In this direction, the system of culturing fish in cages has gained much importance (Natarajan, 1976). Although the air-breathing fishes are in high demand and fetch a high market price, hitherto very little attention has been paid to standardise methodologies to culture them (Arumugham, 1966; Banerji, 1972 and Hora, 1945) Among the air-breathing fishes, culture of *Heteropneustes fossilis* and *Anabas testudineus* particularly in tanks or ponds pose certain problems because of their

habitual migration and cannibalistic tendencies which result in poor recovery and production. Therefore, with a view to develop an alternate culture system for these fishes, studies were undertaken by fabricating cages for the culture of *H. fossilis*.

### MATERIAL AND METHODS

*H. fossilis* used for the present study was collected from flooded paddy fields and bees in and around Agartala area. They were maintained in the laboratory in plastic pools of 15 cm/dia. before stocking. The mean length and weight were 12.4 cm. and 7.25 g respectively.

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### Description of cages

The description of the two types of cages used in the present experiment is given below.

**Bamboo cages:-** These were fabricated in the laboratory in two ways, one by using the split bamboo in a cross-wise manner for making  $2 \times 1 \times 1$  m size cages and the other by polishing the split bamboos and tying with plastic guts and iron wire for making  $1 \times 1 \times 1$  m size cages (Fig. 1). In the former, flap-type opening was given on one side of the upper surface of the cage whereas in the latter, two flat type openings were given. The cost of each  $2 \times 1 \times 1$  m cage and  $1 \times 1 \times 1$  m cage was Rs. 25 and 19 respectively.

**Synthetic cages:-** Synthetic cages were made of knotless material. The mesh size was 0.3 cm and all the cages were of  $2 \times 1 \times 1$  m size. The cost of a synthetic cage was Rs. 240.

### Feed

The pelleted feed was prepared from trash fish, mustard oil cake, rice bran and wheat flour which was used as binding material. The protein, fat and moisture of the prepared feed were 20.65%, 12.20% and 24.74% respectively.

The cages were installed with the help of bamboo poles in a pond at Lembucherra near the shore area. Care was taken that the cages were under constant water level of 35 cm. *H. fossilis* fingerlings were stocked at the rate of 50 nos. / m<sup>2</sup> on 11th February, 1980. They were fed regularly with the artificial pelleted feed at the rate of 3% body weight.

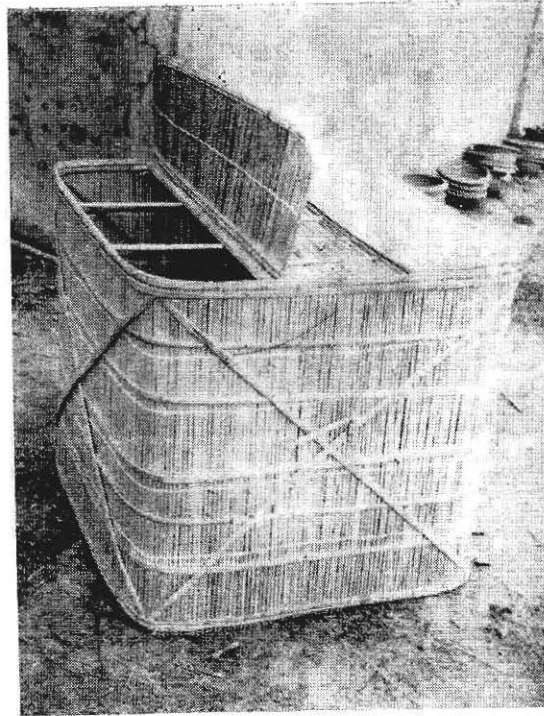


Fig. 1: Split bamboo cage for the culture of singhi.

### RESULTS AND DISCUSSION

The observations on the growth and production of *H. fossilis* in the cages are given in Table I. It may be seen that during the experimental period of 112 days, the fishes stocked in the bamboo cages attained 30.35 g. (weight) and 17.6 cm (length) against the initial values of 7.25 g and 12.4 cm. In the synthetic cages, the respective values were 28.50 g and 17.3 cm. The survival of fishes was found to be higher in bamboo cages ranging from 80 to 84% whereas in synthetic cages, it was from 72 to 76%. The gross production obtained in bamboo cage was 1242.35 g / m<sup>2</sup> whereas in synthetic cages it was 1054.50 g / m<sup>2</sup>. The higher

TABLE 1 :- Growth and Production of *H. fossilis* in Cages.

Cage type	Mean survival	Net Production/ m <sup>2</sup> (g)	Gross production/ m <sup>2</sup> (g)	Final wt. (g)	Initial wt. (g)
Bamboo cage (1 × 1 × 1m and 2 × 1 × 1m)	7.25	30.35	1242.35	947.10	82%
Synthetic cage (2 × 1 × 1m)	7.25	28.50	1054.50	785.25	74%

survival in bamboo cage might be due to its hard substratum. Further, this would have simulated a semi-natural condition for these fishes. It was also observed that in the synthetic cages, the spines of *H. fossilis* were often found to get struck up and as a result, mortality occurred. Further, in synthetic cages, probably there might have been some loss of food materials also. Thus these factors would have contributed to the poor growth in the synthetic cages.

The mean growth increase in the cages was found to be comparable to the gain achieved in cages of Assam by Dehadrai *et al.* (1974) and in rice fields where *H. fossilis* was shown to grow about 25 g. during 60 days culture period (Dehadrai, 1981). Further, the rate of growth in cages is found to be higher than that of singhi cultured in plastic pools where it was observed that the growth rate ranged from 16.0 to 18.38 g. in a period of 100 days.

However, the rate of growth is slightly lesser than the cage cultured Indian major carps where rohu, catla and mrigal were shown to attain an average monthly growth rate of 20, 25, 17mm respectively during pre-winter months and 17, 30, and 14 mm. during post winter months (Natarajan, 1976).

In the present studies, it was observed that during the post-winter, the temperature was congenial for the growth of *H. fossilis* whereas the increased temperature seemed to have adverse effects. Further, during pre-monsoon season many fishes were observed to carry eggs and it was imperative that a part of the assimilated energy would have been utilised for reproductive purpose.

#### ACKNOWLEDGEMENTS

Thanks are due to Dr. N Borthakur, Director, I. C. A. R Research complex at N. E. H., Shillong and Dr. Laskar, Joint Director, Tripura Centre for providing facilities and encouragement.

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