

SEMI-INTENSIVE CULTURE OF HETEROPNEUSTES FOSSILIS (BLOCK)  
FROM A SMALL POND AT ULUBARI FISH FARM, GAUHATI  
THROUGH MONOCULTURE EXPERIMENT

by

S.C. Pathak , Y.S. Yadava, and M.P. Singh Kohli  
Air Breathing Fish Culture Unit, Central Fisheries (ICAR)  
Gandhi Basti, Gauhati-3 Assam, India

Abstract

In order to exploit small water bodies commercially, a culture experiment of Heteropneustes fossilis with heavy stocking density of 3 lakh fingerlings per hectare was taken up to Ulubari Fish Farm, Gauhati (Assam). The fish were fed with a mixture of ricebran, mustard oil cake, and trash fish meal in the ratio of 1:1:1 at 8-10 percent body weight. Five months culture experiment, started in January and harvested in June, yielded a production of 6 946.6 kg/ha/5 months. The total cost of production per kg of fish comes to Rs. 5.56. The experiment not only proves the economic viability of such venture, but also suggests utilization of fallow carp nurseries during lean period of January to June.

CONTENTS

	<u>Page</u>
1. Introduction .....	540
2. Observations .....	540
3. Economics .....	540
4. Discussion .....	541
5. Acknowledgements .....	541
6. References .....	541

## 1. INTRODUCTION

In view of the scarcity of fish and limited water areas available, a search for additional species besides carp fishes was started in the early seventies (Kulkarni, 1971; Dehadrai, 1972). There were two criteria for selecting the new species for pisciculture: first, the economic viability of such a venture, and second, the suitability of fish for a given body of water. Air breathing fishes, by virtue of their hardy nature, their capacity to breathe atmospheric oxygen and toleration to adverse environmental conditions, permit very high stocking density. Therefore, these fishes have been found to be an ideal group for fish culture use (Tripathi, 1976; Nurugesan and Kumariah, 1976; and Pathak, et al. Mss).

In Ulubari fish farm, a monoculture experiment of Heteropneustes fossilis (Bloch) was taken up to discover the production potential of the species. The experiment was started in the middle of January and harvested in the middle of June 1979. The observations made and production achieved during that period are reported in this paper.

## 2. OBSERVATIONS

A small pond of 0.015 ha water area was stocked at 3 lakh fingerlings per hectare in the month of January 1979 (Table 1). The fish were fed daily with a mixture of ricebran, mustard oil cake and trash fish meal in the ratio of 1:1:1. The feeding of the rate of 8-10 percent body weight per day was carried out during evening hours. The food mixture was soaked in water for 5-6 hours before release. A record of monthly growth by random sampling was maintained so as to know the rate of increment (Fig. 1). As could be seen, the fishes in the beginning had a slower growth rate, but gradually picked up. At the end of the experiment, the pond was harvested by draining out the water column. A record production of 6 946.6 kg/ha/5 months was achieved (Table 2). In all 2 632 numbers of fishes ranging in size from 135 mm to 193 mm were retrieved. According to the agreement of the project, the harvested fish were handed over to the Directorate of Fisheries, Assam. A sizeable quantity of brooders was retained for maturity, fecundity, and future induced breeding studies.

## 3. ECONOMICS

Table 3 shows the overall expenditure involved in the entire experiment. As can be seen, there is no expenditure whatsoever on pond maintenance, liming or fertilizers. Therefore, even by feeding animal protein in the form of fish meal as supplementary feed, the cost of production per kg of fish does not exceed Rs. 5.56/kg. This cost was calculated when the survival percentage was merely 58.5. The experiments conducted earlier have shown better survival percentage (Pathak, et al. Mss.). Thus, if properly managed, the cost of production per kg of fish can further decrease.

## 4. DISCUSSION

Jhingran (1969) has reported the average production in India through mixed culture of major carps as 600 kg/ha. When polyculture of indigenous carps with advance scientific technology was taken up (Das, et al. 1978), the production was found to be 5 174 kg/ha/16 months. Even when the water was replenished (Chaudhury, et al. 1979), the fish yield during the course of a one-year culture period was 7 633.5 kg/ha/year. Against this background monoculture of H. fossilis, giving a gross production of 6 946.6 kg/ha/5 month, only, is highly encouraging. It is significant to note that the production has been achieved from a small pond of 0.015 ha area and the trial has been economically viable. The results amply prove that the smaller water bodies (even of 0.015 ha water area) can be used for commercial exploitation. Low retrieval in the experiment could be attributed to formation of an algal bloom of Microcystis which resulted into heavy mortality. Mortalities due to the bloom of blue green algae has also been reported by Dehadrai (1978).

The culture period of the present attempt was restricted to January to June - the period when traditional nursery ponds which remain fallow after removal of stockable sized carp fingerlings, can be profitably used for semi-intensive air breathing catfish culture (Dehadrai, 1978). This management practice will not only bring about proper utilization of fallow ponds but also give valuable fish production imitating the pattern of double cropping in agriculture.

## 5. ACKNOWLEDGEMENTS

The authors are grateful to Dr. V.G. Jhingran, Director, Central Inland Fisheries Research Institute, for facilities and to Dr. P.V. Dehadrai, Project Coordinator, Air Breathing Fish Culture Project, Central Inland Fisheries Research Institute, Barrackpore, for his keen interest, supervision and for critically going through the manuscript. They are thankful to Shri M. Ahmad, Director and Sri P.K. Dwarah, Joint Director, Assam Fisheries, for their encouragement and cooperation. Thanks are also due to Shri D. Baishya, Superintendent of Fisheries, Kamrup and his staff for the help rendered in successful completion of the experiment.

## 6. REFERENCES

- Chaudhury, H., N.G.S. Rao, G.N. Saha, et al., Record fish production through intensive fish culture in farmer's ponds. J. Inland Fish Soc. India. 10: 19.27 p.
- Das, P., M. Sinha, D. Kumar, et al., Culture of inland major carps with record yield in a demonstration pond. Ibid. 9: 105-110p.
- Dehadrai, P.V., Utilization of swamps for culture of air breathing fishes. 1972  
2nd Workshop on All India Coordinated Research Project on Air Breathing Fishes for Culture in Swamps, Patna, 20-23 December 1972

- Dehadrai, P.V., Review of progress in work under the project with remarks  
1978                    October 1976 to November 1978. IVth Workshop All India  
                         Coordinated Research Project on Air Breathing Fish Culture,  
                         Barrackpore, December 1978
- Jhingran, V.G. , Potential of Inland Fisheries. Indian Fmg. 19(9): 22.25p.  
1969
- Kulkarni, C.V., Fisheries potential of air breathing fishes of India: Combined  
1971                    workshop on All India Coordinated Research Projects on Air  
                         Breathing Fishes for Culture in Swamps and Composite Culture  
                         of Indian and Exotic Fishes, December 1971
- Murugesan, V.K. and P. Kumaraiah, Technical report of the progress made  
1978                    during May 1976 to November 1978 at Karnatake Centre. IVth  
                         Workshop on All India Coordinated Research Project on Air  
                         Breathing Fish Culture, Barrackporè, December 1978
- Pathak, S.C., Y.S. Yadava, and D.N. Singh, Observation on mixed culture  
Mss.                    experiments of Air Breathing Fishes conducted in derelict  
                         and freshwater ponds in Gauhati.
- Tripathi, S.D. and S.R. Das, Production potential of Clarias with carps in  
1976                    ponds. Third Workshop on All India Coordinated Research Project  
                         on Air Breathing Fish Culture, Bangalore, September 1976.

Table 1. Stocking details of Heteropneustes fossils

Pond area (ha)	Date of stocking	Stocking density	Number actually stocked	Size range (mm)	Initial average length (mm)	Initial average weight (g)	Total weight of fingerlings at the time of stocking (kg)
0.015	16.1.79	3 lakh fingerlings per ha	4 500	76-120	106	4.6	21.1

Table 2. Harvesting details

Date of harvesting	Duration of experiment	Feeding ratio*	Final size range (mm)	Final average length (mm)	Final average weight (g)	Number of fishes harvested	Survival (%)	Total weight obtained (kg)	Gross production (per ha)	Net production (per ha)
19.6.79	5 months	M.O.C. Rice-bran Fish meal 1:1:1	135 to 193	157.8	39.6	2 631	58.5	104.2	6 946.6 kg/ha/ 5 months	5 540 kg/ha/ 5 months

\* Feeding rate: 8-10% body weight

Table 3. Economics of the production

SI No.	I t e m s	R a t e	Quantity	Total amount spent (in Rs.)
1	Fish fingerling cost	at Rs. 60.00 per thousand	for 4 500	270.00
2	Mustard oil cake	at Rs. 0.60/kg	for 155 kg	93.00
3	Ricebran	at Rs. 0.30/kg	for 155 kg	46.50
4	Fish meal	at Rs. 1.00/kg	for 155 kg	155.00
5	Cowdung	at Rs. 2.00/100 kg	for 500 kg	10.00
6	Diesel cost towards dewatering of the pond	at Rs. 1.25/l	for 4 hours	5.00
				579.50

Cost of production per kg of fish = Rs. 5.56

Present market rate in Gauhati = Rs. 16.00/kg

Net profit per kg = Rs. 10.50

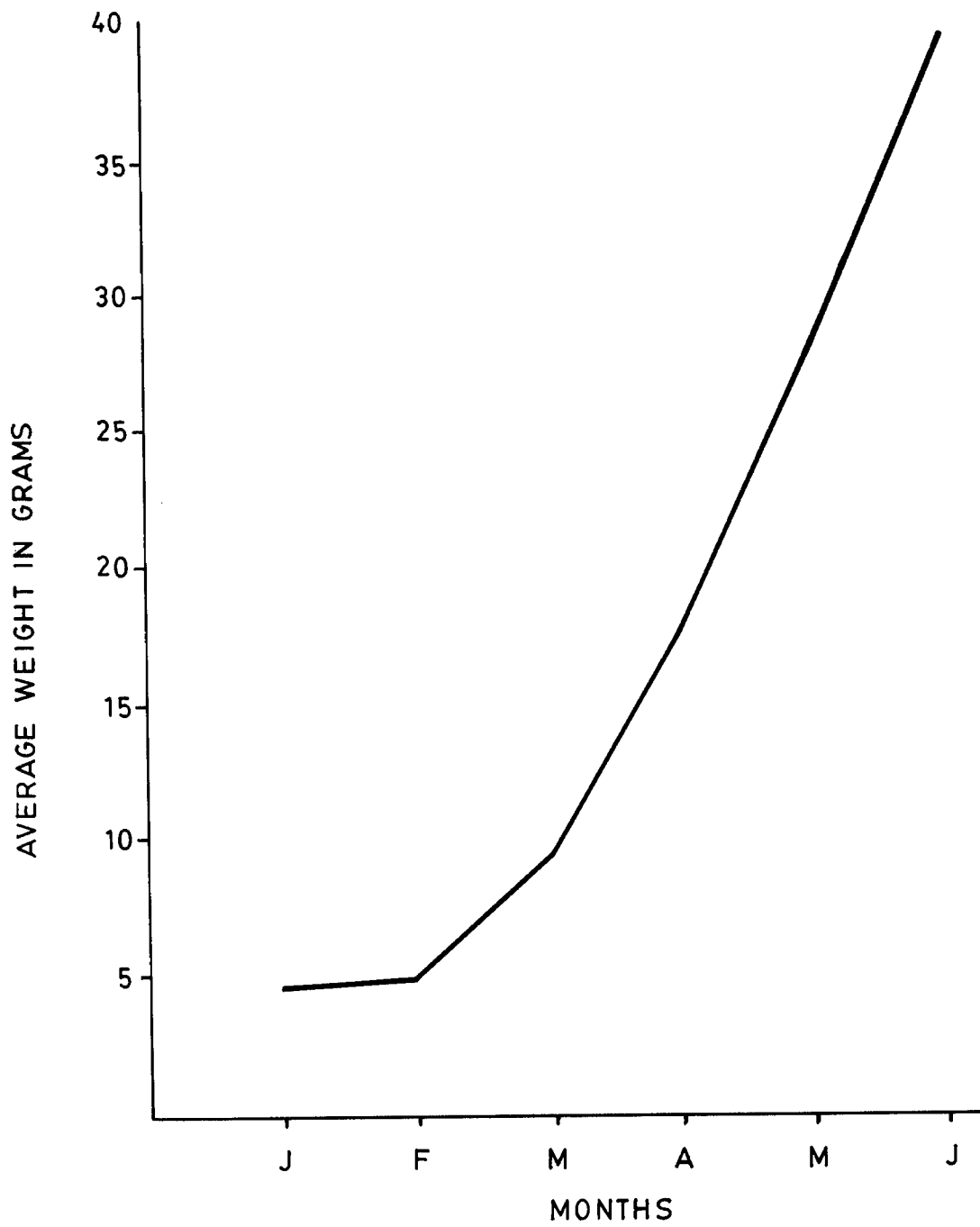


Figure 1. Average weight attained by H.fossilis in different months





Fig. 2 Photograph showing a haul of H. fossilis