Preliminary Studies on Larval Rearing of an Endangered Fish of Northeast India, *Ompok Bimaculatus* (Bloch) for Future Conservation

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Abstract

In the present research work, an attempt was made to standardize the larval rearing technique of *Ompok bimaculatus* (Pabda), an endangered catfish of North-East India for sustainable conservation & diversification of aquaculture in general. Two days old yolk sack larvae were reared in the laboratory conditions for a period of 12 days and survival percentage at the end of the experimental period was recorded. The results of the study showed that it was possible to obtain a survival percentage ranging from 47% - 62%. Further, rearing of larvae in cement tanks for a period of 30 days resulted in a survival percentage of about 90%. The results demonstrate the potential to improve larval survival by providing apt food and water quality conditions.

Keywords *Ompok bimaculatus*; Larval rearing; Survival and Conservation

Introduction

*Ompok bimaculatus*, a non-air breathing silurid fish with the highest growth amongst the three species under the genus *Ompok* namely *Ompok pabda*, *O. pabo* and *O. bimaculatus* and these fish are commonly known as Pabda. The species has been categorized as an endangered fish species and is listed amongst the 91 endangered fish species of India as per the International Union for Conservation of Nature and Natural resources (IUCN) criteria. Most importantly, amongst the 91 endangered species, 31 species have been reported to be from northeast and out of 31 species, 11 species have been reported to be endemic to the region. *Ompok bimaculatus* is amongst the 11 such species. Further, it has been reported that *Ompok bimaculatus* wild population has undergone a steady decline (>50%) over the last 10 years and the species is facing high risk of extinction in the wild in near future (Conservation Assessment and Management Plan workshop, 1997; Sarkar and Ponniah, 2000; Ponniah and Sarkar, 2000). The depletion of natural resources at an alarming rate warrants immediate action to arrest and reverse the trend at the earliest. Aquaculture can help in conservation of this fish species through various ways: reduction on fishing pressure by partly meeting the consumer requirement from culture, restocking of natural water bodies with the seed produced under controlled conditions and creation of opportunity for the fishers to undertake the culture of this species. For the successful culture operation development of reliable breeding and larval rearing technique is essential.

Recently, Government of Tripura has declared the fish (*Ompok bimaculatus*) as “STATE FISH” and reported that “it is an important fish of the state and is in endangered condition and needs more attention for conservation and propagation”. Eating of Pabda fish (particularly in Tripura) is generally considered as the status symbol and the species is the most expensive food fish (Rs 350-450/-/kg).

Though the State Fisheries Department was able to breed the fish under controlled conditions, very low survival during larval rearing was reported as the major limiting factor. Several other researchers working on the larval rearing of pabda in other part of the country (Shreedhar et al., 1998; Bhowmik and Ayyappan, 2000; Bhowmik et al., 2000; Chakraborty et al., 2006; Hussain, 2006; Chakraborty et al., 2007) also have reported that during larval rearing of pabda, very poor larval survival is the common problem noticed. Hence, in the present study, an attempt was made to standardize the larval rearing technique of pabda (*Ompok bimaculatus*).
1 Materials and Methods

The adult fish were collected from the natural resources (Rudrasagar Lake, Sepahijala District, Tripura) in the month of May, 2007 and stocked in the earthen ponds (0.03 ha area) of the College of Fisheries, Lembucherra, Tripura. The fish were fed with small fish, prawn and artificial feed (mixture of rice bran, mustard oil cake and dry fish powder) ad libitum and reared for a period of two months. In the last week of July, 2007 4 numbers of fully matured male and female fish (each) were selected. The female fish were injected with ovaprim @ 1.0ml/kg body weight while the male fish were injected with ovaprim @ 0.5ml/kg body weight. The average weight of the broodfish was in the range of 40-45 gm. After injection, the fish were kept in a breeding hapa and maintained in cement cistern having a mild water flow. After 8 hours of injection, the fish were taken out of the hapa, and the male fish were dissected and the testes were removed and sperm suspension was prepared by macerating the testes in the physiological saline in a mortar and pestle. The female fish, in which the eggs were oozed out easily with gentle pressure on the abdomen, were selected and stripped and eggs were collected in a clean enamel tray and fertilized with the sperm suspension by gentle mixing with help of a feather. The fertilized eggs were washed with clean water and kept in a flow through system for hatching. The eggs started hatching after 20 hours and within 24 hours all the eggs hatched (at a water temperature of 27°C). The hatchlings were kept on the flow through system.

Two days old hatchlings were collected randomly and stocked in glass aquaria containing 50 liters clean pond water each with 50 numbers of larvae. Altogether six aquaria were used and larvae stocked in three aquaria were fed with freshly hatched artemia nauplii and larvae stocked in rest three aquaria were fed with filtered zooplankton collected from well prepared fertilized ponds. The larvae were fed from the third day after hatching (i.e. on the second of stocking in the aquaria). The larvae were fed ad libitum, twice daily (7 am and 4 pm) and the concentrations of the live feed (artemia nauplii/ zooplankton) in the aquaria were adjusted depending on the residual live feed concentration in the tank. Every day, about 30-40% of the water was exchanged with fresh clean pond water (stored in a FRP tank). The larval rearing was carried out for a period of 12 days and at the end of 12 days, the surviving larvae were counted and survival percentage was calculated. Ten numbers of larvae from each of the tank were collected and there individual weight and length were taken. The survival percentage and the growth data (length and weight) were subjected to chi-square and t-test, respectively for finding out the significant difference between two different groups i.e. fed with zooplankton and artemia nauplii. Further, 125 numbers of 12 days old larvae were stocked in a cement cistern of 50m² area having 6 inch soil bed and prepared in advance following the procedure of nursery ponds. The larvae were reared in the cement cistern for period of 30 days and were fed with a mixture of rice bran, mustard oil cake and dry fish powder once daily. At the end of thirty days, all the fish were harvested counted and length and weight of fish were taken before stocking into stock pond.

2 Results and Discussion

Survival percentage and growth of larvae during the 12 days experimental period is presented in Table 1. Average survival percentage of the group of larvae fed with artemia was 62% where those fed with zooplankton showed a survival percentage of 47% and the statistical analysis (chi square test) indicated that the difference in survival between the two groups were significant (p<0.01). Average growth in terms of length and weight were 25.3 mm and 112 mg, respectively for the group of larvae fed with artemia nauplii and for the group of larvae fed with zooplankton, average growth in terms of length and weight were 24.3 mm and 94 mg, respectively and statistical analysis (t-test) indicated that the growth of the group of larvae fed with artemia nauplii was significantly (p<0.05)
different from that of the larval group fed with zooplankton. Average survival percentage of the 12 days old larvae after 30 days of rearing in the cemented tank was 90% and the mean growth in terms of length and weight were 7.5cm and 3.34gm, respectively.

There are very few reports on the breeding and seed production of pabda (Shreedhar et al., 1998; Hussain, 2006, Chakraborty et al., 2006; 2007), but the survival percentage of larvae has not been reported by most of the researchers except Hussain (2006), who has reported 7.89% survival in a rearing period of 9 to 19 days growth. Sridhar et al. (1998) and Chakraborty et al. (2006 & 2007) have reported that, in the larval rearing of pabda, high mortality rate in the initial stages of seed raising continues to cause a major management problem.

It has to be noted that Hussain (2006) and all other researchers had carried out the study in the earthen nursery pond but the present experiment was carried out in aquaria. This facilitated easy feeding and allowed the larvae to pray on the food. In addition to survival the length and weight attained by the larvae were also satisfactory. Shreedhar at al. (1998) had reported that at 12 days post hatching the growth of larvae were about 8-12 mm, but, in the present study, at the end of 12 days post hatch, the growth of larvae were 24-25 mm and this was higher than the growth after 30 days of post hatching reported by the same author. Further, at the end of rearing period of 30 days in the cement tank a survival percentage of about 90% was achieved and the larvae had achieved a growth of about 3.5 gm and length of 7.5cm. As mentioned earlier, it has to be noted that the present study was carried out in the aquaria and cement tank while other researchers have carried out their studies in field conditions that too in earthen nursery ponds. However, such encouraging results indicate that by changing the management practices, there is possibility to improve survival and growth. Future, studies should be under taken to develop practical systems that can be adopted by seed producers.

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