

Conservation of the Asiatic catfish, *Clarias batrachus* through artificial propagation and larval rearing technique in India

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The Asian catfish, *Clarias batrachus* popularly known as *magur* is highly popular in India as an expensive table fish. It is distributed in Eastern and North Eastern India particularly in West Bengal, Orissa, Bihar, Assam and Meghalaya and other Asian countries such as Thailand, Philippines, Cambodia, Myanmar and China. The availability of wild-caught magur seed is insufficient to meet demand due to a combination of over-exploitation, aquatic pollution, spread of disease, uncontrolled introduction of exotic fishes and habitat modification. To conserve this species and to sustain large-scale culture as an economic proposition, it is becoming increasingly necessary to take up breeding and larval rearing of magur under controlled conditions.

We conducted a study of the breeding and larval rearing of *C. batrachus* in both on-station and on-farm situations, mainly at Canning, Nimpith and Kalyani of West Bengal. This article documents our successful experiences and I hope that it will assist farmers to take up culture of this species and to profit from it.

Identification of mature brood fish

Mature male and female fish can be identified by observing their genital papillae. A fully mature female looks a bit heavier as its abdomen is distended with eggs. A male on the other hand looks slender and more streamlined. In the females the genital papillae is short, oval and slit-like and protrudes or draws with even the slightest pressure on the abdomen. In males, the papilla is conical and elongated with a pointed reddish tip and it never draws in.

Selection of Brooders

Farm raised brooders as well as monsoonal migrating stocks are used for breeding. In selecting brooders, care should be taken to assure that they are healthy and free from obvious signs of disease, with barbels intact and at least one year in age and more than 150g.

Triggering dose of inducing agent to brooders

Two types of inducing agent, carp pituitary gland extract (CPE) and Ovaprim were used. The ideal dose of CPE is 20mg / kg body weight for males and 35mg / kg body weight for females. The ideal dose of Ovaprim is 0.75ml and 2ml / kg body weight for males and females respectively. The fishes were injected near the base of the pectoral fin. After injection, they were kept in a cement cistern with aeration. The females were kept under observation to detect the most appropriate time for stripping. This can be determined by holding the female in vertical position and applying slight pressure to the belly. The free flowing condition of the female is reached when eggs come out spontaneously as soon as the fish is tilted backwards from its vertical position. Usually female fish attain the free flowing condition of eggs around 17 hours after injection.

Milt collection

When the optimum time for stripping was reached, both male and female fish were anesthetized by applying a mixture of 1:4 clove oil and absolute alcohol @ 5 ml / 50 l of water for easy handling of the brooders. Deep



Triggering dose.



Milt collection requires removal of testes.



Fertilised eggs.

anesthesia takes 25-30 minutes to achieve. The abdomen of the anesthetized male was cut open and the two testicular lobes taken out and quickly cleaned with cotton. Thereafter the testes were cut into small pieces with the help of a fine scissor and collected on a piece of fine meshed net dipped in a small glass bowl filled with 0.9% saline solution. The pieces of testis are then squashed within the piece of net and the sieved milt is collected in the bowl containing the saline solution.

Stripping and Fertilization

The anaesthetized female fish were held and pressure applied on their belly. The orange to greenish eggs come out from the vent as a spray and were collected in a clear sterilized enamel bowl. While stripping was being done, the milt suspension (in 0.9% saline solution) was collected with the help of a dropper and spread uniformly over the stripped eggs. At the same time, the egg and milt suspension is mixed with the help of a fine soft brush for fertilization. When stripping and subsequent addition of milt suspension was completed, the bowl was vigorously shaken for a few seconds to improve fertilization. Thereafter, freshwater was added in the bowl to wash away the residues and washings were poured out. Milt collection to fertilization should be completed within 2.5 minutes. Generally, fertilization rates of 80 % and 70% were obtained with CPE and Ovaprim respectively if all the conditions remain favourable. The fertilized eggs are transparent while the unfertilized ones become opaque within four to five hours.

Hatching

Fertilized eggs were successfully hatched in two different ways according to the available resources. In one case, a carp hatchery was used. In this method fertilized eggs were spread first on a soft mosquito net frame, which was submerged under flowing water. In the second method, fertilized eggs were cleaned through repeated washing and water hardened fertilized eggs then put into a flow through system of glass jars or plastic tubs for further development, incubation and

hatching. Generally the eggs hatch within 20-24 hours depending upon the water temperature. The optimum pH and water temperature for successful hatching was found to be between 7-8 and 27-31 °C respectively. The optimum hatching percentage can be 75% if the above management is done meticulously.

Larval rearing

Larval rearing of *C. batrachus* can be divided into three phases.

Phase I: The plastic trays used for the rearing of hatchling were rectangular in shape (0.4m x 0.25m x 0.08m). The hatchlings were usually stocked in the rearing tanks @1000 individuals/liter maintaining a constant flow of water and depth of 6cm. Yolk sac absorption is usually completed within four days. No food was applied until the hatchling reaches the spawn stage (yolk sac absorption) as mouth and other internal organs are fully developed only when the spawn stage is achieved. Decomposed eggs, eggshells and other dirt were siphoned out thrice daily.

Phase II: Larger rectangular plastic trays were used (1m x 0.5m x 0.25m) with continuous water flow and slightly greater depth of 8cm maintained in the rearing tray. Stone chips (0.5cm) were provided in the corners and middle of the tray as hides to reduce cannibalism. The spawn were usually stocked @100 individuals per liter of water. Finely sieved (40-50 µm filtered) live zooplankton @ 0.4ml/100 individuals was given daily at 0600, 1200 and 1800. At the time of feeding the water inlet and outlet were stopped for about two hours to facilitate feeding. Excreta and decaying particles were siphoned out three times daily. After eight days of rearing, the fish had reached fry stage (16mm in length and 30mg in weight).

Phase III: A cemented cistern (2m x 1.5m x 0.5m) was used for the rearing of fry. Continuous water flow with a water depth of 15cm was maintained. Stone chips (0.8cm) were provided in the corners and middle as hides to reduce cannibalism, along with some water hyacinth. The fry were usually stocked @25 individuals/liter of water. Finely minced tubificid worms were fed @ 2% of the total biomass at 0600 and 1800 hrs and home made prepared feed at

1200 and 2400 hrs. The artificial feed was prepared with a mixture of molluscan meat (70%), egg (20%), soybean cake (10%) and vitamin B premix (500mg / kg feed). These ingredients were boiled and prepared as a paste like mixture and then vitamin B was mixed in. This prepared feed was then applied in the form of dough balls.

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