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Original Article

Conservation of an Endangered Indian Catfish *Ompok malabaricus* through captive breeding and Establishment of captive population

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Abstract

The breeding of butter fish (*Ompok malabaricus*) using hormonal inducement and environment stimuli were evaluated in natural and artificial substrates. A successful spawning was observed in all the experiment sites, using of a single intramuscular injection of ovaprim (dosage 0.5 ml/kg body weight). Spawning was observed in 12.-13 hrs after injection. Averages of 5584±100 egg were spawned by each female. Hatching was occurred 26 hrs after spawning. Hatchlings were cultured up to fingerlings size to about 60 days. A total number of 1600 fingerlings were reintroduced into the upstream of Gadana river in Western Ghats.
Keywords: *Ompok malabaricus*, endangered, induced breeding, captive population

Ompok malabaricus is a silurid air-breathing catfish. It s commercial value exceed that of major carps. Over the last few decades its wild population has been exceed that of major carps. Over the last few decades its wild population has been declining rapidly. It is one of the critically endangered species of India according to IUNC status (CAMP,1977). The current distribution is in plains and sub mountain stream of Western Ghat (Arunachalam 1999). It is carnivorous fish inhabiting the lower reaches of river and reverine wetlands from an elevation of 50-1000 m. Reasons for the decline and overexploitation, loss of habitat, disease pollution siltation, poisoning, dynamiting and other destructive fishing activities, Conservation and Assessment and Management of freshwater fished of India (CAMP,1977) has recommended the need of established captive population through induced breeding induced reproduction of *O. malabaricus* has been carried out in two ways one by environment manipulation and the other by hormonal treatment. Using both the methods, three artificial sites were selected for spawning. The first one is a tank set up with sand bed with moderate water flow, second one is tank water with sand bed breeding cage and the third one is breeding hapa inside a natural pond.

Eighteen spawners were collected from Gadana river of Western Ghats in the Kalakad Mundanthurai Tiger Reserve in Tirunelveli district. This river forms of sub basin of the major river Tamiraparnai a east flowing one is south Tamil Nadu. Collection was carried out during March and April and the fishes were stocked in an earthen pond (13 x9 x2m) near the Gadana reservoir for seven months after which they were segregated into 6 sets. (male to female ratio of 2:1) of spawners (Fig.A). They were induced to spawn. The first three sets (without hormonal treatment- natural breed) were released into 3 different breeding sites. Observations were performed for a period of three days and during this period there were no released of eggs. Next three sets were induced to spawn by a single intramuscular injection of ovaprim (syndel Labouratory, Canada) at a dosage of 0.5 ml/kg body weight of fish. After the injection in17.30 hrs, each breeding set consisting of two males and single female was released into the three breeding sites. Spawning was occurred in 12.15 hrs after injection. After spawning, fertilized eggs were collected, counted and the percentage of fertilization was determined. Results of induced breeding experiment are summarized in table-1.

The number of eggs spawned varied from 603 to 5584 during the experiment in all setups. In the hormonal treatment high number of egg production was observed in second set followed by the first and third breeding site (table-1). The egg (Fig.B) was transparent adhesive and were found attached to the sand bed of the tanks. The egg diameter was 2.1± 0.01 mm and the fertilization rate was 78%. Hatching was proceeded by intensive agitation of the larvae inside the eggshell. Hatching was

occurred in 26-28 hrs after spawning and the hatching were pale yellow in colour. The survival of hatching varied from 54 to 63% (table-1).

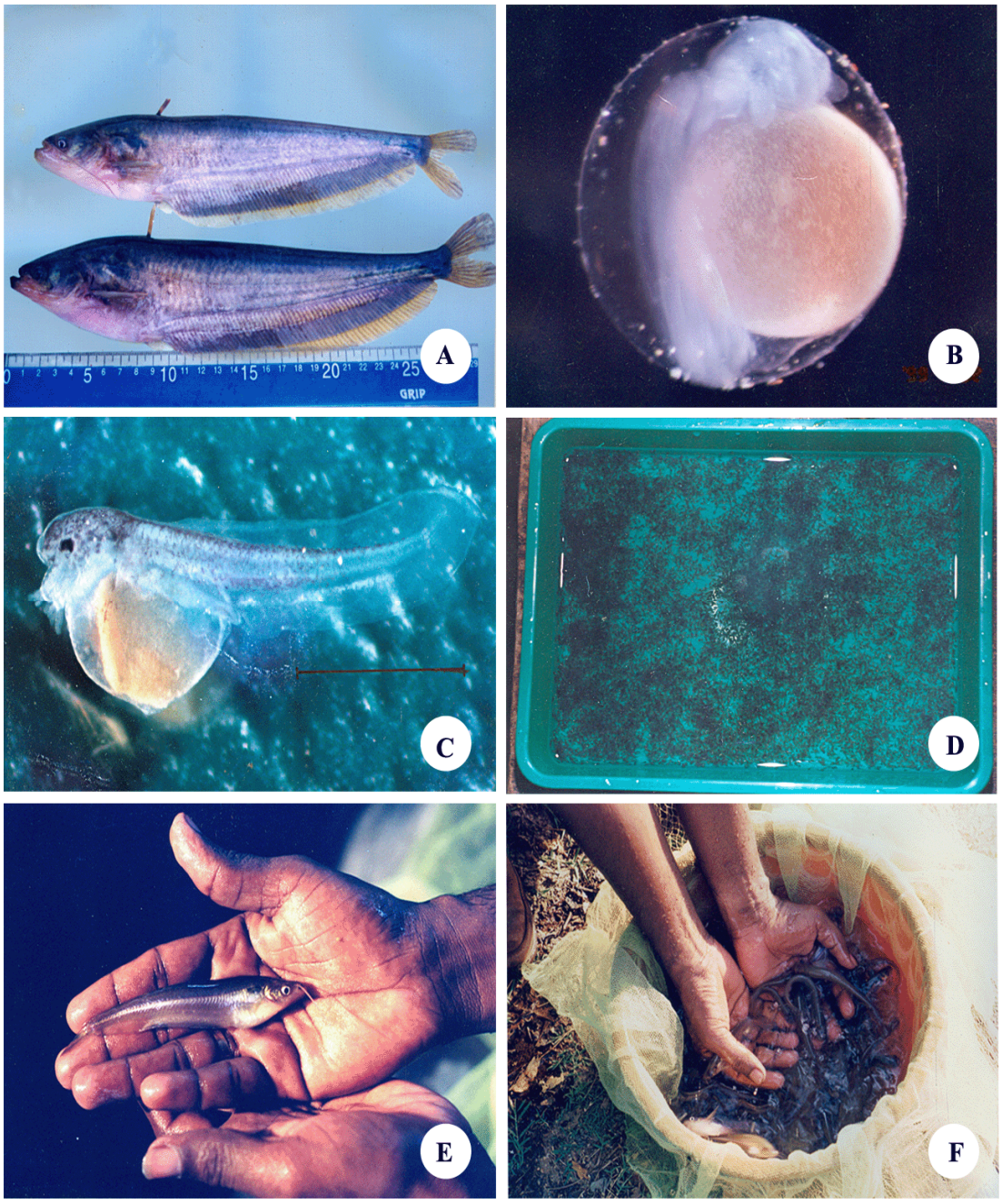

Fig-1: A. Breeders of *Ompok malabaricus* (male & female)
B. 12-h-old embryo of *Ompok malabaricus*
C. Three-day-old pro larvae of *Ompok malabaricus*
D. Fourteen-day-old post larva of *Ompok malabaricus*
E. Three- months old juvenile *Ompok malabaricus*
F. *Ompok malabaricus* sampled after six months of culture

Table-1: Induced breeding in *O malabaricus* using ovaprim in spawning different site

Exp	Wt of Female fish (gm)	Wt of Male fish (gm)	Hormone dosage (Ml/kg bw)	Spawning site	Time Taken for response	No. of eggs spawned	Fertilization	Survival at catching (%)
1	360	258 280	0.5	1	13	753	62	51
2	345	275 260	0.5	2	11	4422	74	73
3	345	230 245	0.5	3	15	603	68	57

The free embryo and larval development was mentioned up to fingerlings stage and was classified based on the standards described by Gorodilov (1996). One day after the hatching the pre- larvae were 2.8-3mm in total length (TL). They swam very fast and rested on their lateral side due to their heavy yolk content. The Pro larvae were transferred to rearing hapa (15 x 0.5 x 0.5m). Four days after the hatching since the mount was completely formed they were ingested with exogenous feed consisting of plankton (Vijayakumar,2002). The mixed nourishment period ensued the post larval stage. Larval stage was continued for 17 days after which they schooled under weeds in the hapa and came out only to feed. At this stage they were termed juveniles. The juveniles were transferred to cement culture tank and fed with finely chopped beef liver and chicken intestine. After 30 days of hatching juveniles were 22.-2 mm in TL and resembled the adult with respect to all external characteristics indicating the end of the juvenile period.

In ninety days (Fig.E) after hatching 1600 fingerlings of *O. malabaricus* (length 9.3 ± 0.5cm weight = 6.3g) were released into the natural habitat of Gadana upstream and 245 were retained for further studes o malabariculs attained a length of 18.5 ± 0.04 cm; and weight of 120+0.32g (Fig. F) after five to six months of culturing. Induced breeding of this fish enabled us for the first time to produce a captive population for the reintroduction of the fingerlings. The ovaprim has been found effective in inducing ovulation in *O. bimaculatus* (Sridhar *et.al.*, 1998) and in *O. malabaricus (*(Vijayakumar,2002). The time taken for response and fertilization rate in the present experiment of *O. malabaricus* (78% ; table- 1) is complete to earlier report of *O. bimaculatus* (75%), *Heteropneustes fossils* (80%) using ovaprim (Vijaykumar,1998); *Clarias macrocephalus* (60%) using LHRHa+ PIM (Alok *et.al*.,1993), *Silurus asotus* (81.5-98.0%) (Chori *et.al.*,1992), *Silurus glanis* L (above 80%) using LHRH-a and ovaprim. The present dosage of 0.5 ml/kg body weight of ovaparim may be used as standard in future breeding of *O. malabaricus*. With the induced breeding of *O. malabaricus* which has been completed successfully a captive population of 245 individuals has been maintained for further study. Juveniles are maintained as a part of the captive population reached the adult size approximately 22-26 cm TL by the age of 7 months.

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