

Short Communication

## A comparative account on the induced breeding of major carp *Cirrhina mrigala* by pituitary extract and ovaprim

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**Abstract:** Experiments were conducted on males and females of a major crop *Cirrhina mrigala* by injecting pituitary extract and ovaprim to observe the efficacy of ovaprim during induced breeding. The results were satisfactory and enhancing as ovaprim induced breeding in *C. mrigala* and the spawning took place within 9 hr with 91% overall fertilization. The present study suggests that ovaprim might be considered best substitute for pituitary extracts during induced breeding.

**Key words:** *Cirrhina mrigala*, Pituitary extract, Ovaprim, Induced breeding.

### Introduction

In India culture of carps is a very old practice along with China, as for in China, carp culture is being practiced since long time ago. Carp culture is common in India and spread throughout the country. In Maharashtra only the major carps are cultured. The carp culture improves the social and economic status of farmers by adopting new scientific technology for breeding (Nandeeshsha and Rao, 1989).

However, the major problem in the carp culture is the non-availability of quality fish seed. In early years fish seeds were collected from river coasts by cloth happas, but this technique was unsafe as with the collection of carp seed, some seeds of predatory fishes were also collected accidentally. Chaudhary and Alihunhi (1957) for the first time successfully carried out the spawning of Indian major carps with induced breeding by pituitary extracts. This technique was then used all over India but the potency and the quality of the pituitaries used for preparing the extract became undependable, and because of this problem there is failure in spawning and results of pituitary extracts in many farms.

Human chorionic gonadotropin (HCG) was then used, as a substitute for pituitary gland but it could not get the success as it was thought (Chonder, 1985). The search for a suitable substitute was going on and then after ovaprim was introduced in the market as a substitute for pituitary gland. All the fish breeders readily showed acceptance for this drug (Nandeeshsha *et al.*, 1990b). Ovaprim utilizes the fish's own hormonal control mechanism to safely induce maturation and coordinate spawning dates. Ovaprim contains analogue of *Salmon* GnRH, and dopamine inhibitor required for culturable species. The present investigation was conducted to ascertain comparative efficacy of pituitary extracts and ovaprim in *C. mrigala*.

### Materials and Methods

All the experiments were performed in Paithan fish farm in a Chinese hatchery 55 km away from Aurangabad

(Maharashtra), the historical city of Ajanta and Ellora. Mature females and males were selected on the basis of their external secondary sexual characters (Jhingran and Pullin, 1984).

Ten females and five male control fishes were injected with carp pituitary extract with two doses for females accordingly 4 and 9 mg/kg at an interval of 5 hours and a single dose for the males 4-5 mg/kg at the time of second injection to the females. 0.4 ml/kg dose of ovaprim was given to 10 females and 0.2 ml/kg dose to 5 males. Only a single dose of ovaprim was given to both the sexes.

### Results and Discussion

Experiments were conducted in July with temperature around 28°C, little showers of rain and weather being conducive for breeding. Control fishes injected with pituitary extract spawned after 16 hr, while females injected with ovaprim spawned within 9 hr. The positive response of *Mrigal* to ovaprim indicated the higher potency of this drug in inducing the spawning. *Cirrhina mrigala* have been reported to spawned with 10 mg of Pimozide (Haul and Rishi, 1986), and the results obtained from ovaprim is supported by the results of the trials in 1988 and 1989 (Nandeeshsha *et al.*, 1990 a and b).

Certain drugs have been tested for induced spawning in fishes with variation in the percentage of success (Harvey and Hoar, 1979). However, the difference in dosage among different species is due to the varied levels of dopamine activity (Billard *et al.*, 1983; Peter *et al.*, 1986).

The number of egg count in control was 14.00 lacs with overall fertilization 60% and with ovaprim injected fishes eggs were 21.54 lacs with overall fertilization of 91%. The failure of spawning by various extracts revealed that dopamine inhibitor plays an important role in synthesis of gonadotropin (Peter *et al.*, 1986).

In this study only a single dose of ovaprim induced spawning within 9 hr while the control females were given two doses of extract, still their spawning was delayed and also

fertility was found less than those of the ovaprim injected. Peter (1986) had ascribed as self potentiating action of the releasing hormone to some drugs when given in two doses.

In India, most of the breeders have been preferring ovaprim, as a survey showed that only 10 to 15 % of fish breeders use extract due to its complexity of technique (Dehadrai, 1984). Ovaprim is effective in induced spawning because it contains *Salmon GnRH*, native peptide found in most teleosts, also contains a dopamine inhibitor (brain neurotransmitter). Our results indicate that ovaprim might be considered best substitute over pituitary extract during induced breeding.

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