

**Promotion of induced spawning of *Cyprinus carpio*(Linn.)for poverty alleviation and genetic resource conservation in the Thar Desert.****Anita Jhahria**

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Abstract

*Six induced breeding spawning experiments were conducted on *Cyprinus carpio*(Linn.) using ovaprim (@0.5ml/kg brooder weight) and ovatide (@0.3ml/kg brooder weight) in the modified CIFE-D81 Hatchery Unit of the Thar Desert. The average number of eggs (1.94 lakhs), fertilization rate (56%),hatching rate (70.5%) and spawn production (1.296 lakhs) were obtained after injecting ovaprim. Whereas, ovatide yielded no. of eggs (2.89 lakhs),fertilization rate (88.6%),hatching rate (77.3%) and spawn production (1.941 lakhs).MPOWER (funded by IFAD) project will promote development of small scale freshwater aquaculture in the six district blocks of the Western Rajasthan to alleviate poverty. It will also serve as a tool to benefit large number of rural women involved in various aspects of aquaculture activities and to apply the induced breeding technique to conserve the threatened fish species of the Thar Desert.*

Keywords: *Induced spawning,Cyprinus carpio,aquaculture and alleviate poverty.*

I. Introduction

Our country is bestowed with rich natural resources in which the freshwater living resources are of prime importance in view of the total dependence of the humanity on these resources for its well being. About 11% (2,200) of the total world fin fish species (more than 20,000) have been recorded from the Indian subcontinent. The availability of quality seed is prerequisite for rapid expansion and growth of aquaculture.

The gap between demand and supply of quality seeds, by and large, remains a daunting task in rural aquaculture development. MPOWER (Mitigating Poverty in Western Rajasthan) funded by IFAD (International fund for Agricultural Development) seeks to promote small scale aquaculture production by involving a large no. of rural women by targeting the BPL Households (86,880 in 1040 villages.)

The present study seeks to describe linking women's empowerment and their participation in aquaculture and to test the effectiveness of ovaprim and ovatide in induced spawning of *Cyprinus carpio*. The assessment framework developed will help to alleviate poverty and also to conserve threatened fish species of this region.

II. Materials and Methods

Healthy brooders of *Cyprinus carpio* (Linn) were collected in the happa, by operating cat net in the local ponds and lakes. These were then brought to the hatchery (modified CIFE-D81 hatchery unit) and were fed on oil cake and rice bran (1:1) The male brooders have fine denticulations on the dorsal side of pectoral fin rays while female brooders have smooth –to-touch pectoral fin with a soft and bulging abdomen,. Ovaprim (manufactured by Syndel Laboratories, Canada, marketed by Glaxo company in India) and ovatide (manufactured by Hemmo Pharma, Mumbai) were injected in two male

and one female brooder intramuscularly .Ovaprim(@ 0.5ml/ kg brooder) and ovatide (@0.3 ml/ kg brooder) contains synthetic gonadotropin releasing hormone analogues (GnRH_a) .

The brooders were removed from the breeding tank after successful breeding. The eggs of common carp are of adhesive type and got attached to the polyethene strips (length =75cm, width =10cm) of black & translucent colors which were transferred to the hatching unit. The Fertilization and Hatching % were calculated as depicted below:

$$\text{Fertilization rate \%} = \frac{\text{no. of fertilized eggs} \times 100}{\text{Total no. of egg counted}}$$

$$\text{Hatching rate \%} = \frac{\text{No of eggs hatched} \times 100}{\text{Total no. of egg in a batch}}$$

III. Results

In the percent study, using ovaprim drug in 03 exercises an average number of eggs (1.936 lakhs), fertilization rate (56%) , hatching rate (70.5%) and spawn production(1.296 lakhs) were obtained whereas by injecting ovatide in 03 exercises an average egg production (2.89 lakhs,) fertilization rate (88.6%) ,hatching rate (77.3%).and spawn production(1.942 lakhs) were obtained .(Fig.1 & Table 1)

The optimum water temperature for induced breeding exercises was recorded between 21. 6⁰C to 25.3⁰C and no hatching occurred at 16.3⁰C. The average weight of male brooder (3.666kg) and average weight of female (3.283kg) of common carp were used in the 06 experiments. Average spawning time (41.8 Hrs) using ovaprim and average spawning time (30.85hrs) using ovatide were obtained in the study. An Average hatching time (59.5hrs) using ovaprim and (63 hrs) using ovatide was recorded in the present work.

IV. Discussion

The synthetic hormones like ovaprim and ovatide are known to act at the pituitary level leading to the secretion of fish's own endogenous gondotropins (Habibi. *at el.* 1989.) Endogenous gonadotropins appear to significantly enhance the secretion of right type of steroids in abundant quantity enabling complete maturity of ova for spawning. Ray (2005) injected ovatide in *Mystus gulio* (@0.2ml) and obtained fertilization to be nearly 90 % and hatching rate at about 80% of the fertilized eggs. Marimuthu *et al.* (2009) using ovatide (@ 0.2ml) in *Cyprinus carpio* obtained fertilization rate (74%) and hatching rate (82.6%).

Khan *et al* (2006) by injecting ovatide in *Labeo rohita* obtained an average egg production (58,000) using ovaprim and ovatide(49,000). The fertilization percentage in rohu were obtained (53%) using ovaprim and (69%) using ovatide by Khan *et al.* (2006) respectively . Mijkherjee *et al.*(2002) have conducted experiments on some threatened fish species *Mystus vittatus*., *Clarias batrachus* ,*Mystus gulio*_and *Ompok pabo*_using ovaprim & ovatide. By using ovatide Mijkherjee *et al* (2002) (@3ml) in Pabda obtained no. of eggs released (20,500) and percentage of hatching (70%) and in Tangra using (@ 2.5ml) ovaprim obtained no. of eggs released (30,000) and percentage hatching (80%).

In the present study, ovatide yielded better results than ovaprim with respect to number of eggs, fertilization rate, hatching rate and spawn production, which differs from the findings of khan *et. al*

(2006) in rohu and shows similarity with the results of Ray (2005), Mijkherjee (2002) and Marimuthu *et. al* (2009).

In Bangladesh, Samina *et al* (2010) have explored correlations between involvement of women in aquaculture and age of women, farming experience etc. The development of rural freshwater aquaculture will provide employment opportunities for women, and help to alleviate poverty in the six district blocks, which are the MPOWER project areas. The synthetic application of hormones will also help to conserve the threatened fish stocks of Rajasthan (Table 2.) MPOWER Project focuses on poverty reduction based on equality to reduce gender discrimination as poverty is the main cause of disparity. With poverty very much a rural phenomenon, women's active participation in aquaculture is crucial to facilitate economic growth and reduce poverty in project block areas.

V. Acknowledgement

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Table 1: Results of induced spawning of *Cyprinus carpio* (Linn) in the hatchery of Thar Desert

Fish Species	Date of breeding	Ovapri m of Ovatide	Time of injection	Wat er Tem p (°C)	Brooder weight in Kg.						Time & Date of egg laying	Spawni ng time (hrs.)	No. of egg laid(lak hs)	Fertili zation (%)	Hatchin g time(hr s.)	Hatc hing (%)	No. of spawn produce d(lakhs)
					Male			Female									
					Before breedi ng	After breedi ng	Weig ht loss	Before breedi ng	After breedi ng	Weig ht loss							
<i>Cyprinus carpio</i>	17.2.2000	Ovapri m	4.00 P.M.	24.3	4.000	3.800	0.20 0	3.300	2.900	0.400	5.10 P.M. 18.02.200 0	25.10	2.04	80	62	70	1.1424
<i>Cyprinus carpio</i>	20.3.2000	Ovatide	10.00 A.M.	25.3↑ 17.9	4.100	3.799	0.30 1	3.900	3.249	0.651	3.20 P.M. 21.03.00	29.20	3.45	82	49	77	2.1783
<i>Cyprinus carpio</i>	30.11.200 0	Ovapri m	2.30 P.M.	24.6↑ 20.2	3.000	2.600	0.40 0	2.500	2.000	0.500	8.00 P.M. 01.12.200 0	30.30	2.62	78	57	71	1.4509
<i>Cyprinus carpio</i>	11.12.200 0	Ovatide	4.30 P.M.	21.6↑ 18.2	3.800	3.400	0.40 0	3.600	3.100	0.500	10.30 P.M. 13.12.200 0	42.00	2.95	90	80	65	1.7257
<i>Cyprinus carpio</i>	10.1.2001	Ovapri m	2.35 P.M.	16.3	3.500	3.300	0.20 0	3.400	3.140	0.260	12.35 P.M. 13.01.01	70.00	1.15	10	-	-	-
<i>Cyprinus carpio</i>	16.2.2001	Ovatide	9.00 A.M.	24.3↑ 17.5	3.600	3.444	0.15 6	3.000	2.674	0.326	6.35 P.M. 17.02.01	21.35	2.27	94	60	90	1.9204

Table 2: Threatened fish biodiversity in Rajasthan

The list includes the fishes:

- *Anguilla bengalensis*
- *Botia lohachata*
- *Ompok bimaculatus*
- *Pseudotropis atherinoides*
- *Anabas testudineus*
- *Bagarius bagarius*
- *Barbodes sarana*
- *Barilius barila*
- *Barilius vagra*
- *Catla catla*
- *Cirrhinus reba*
- *Clarias batrachus*
- *Heteropneustes fossilis*
- *Labeo dero*
- *Mystus vittatus*
- *Osteobrama cotio*
- *Puntius chola*

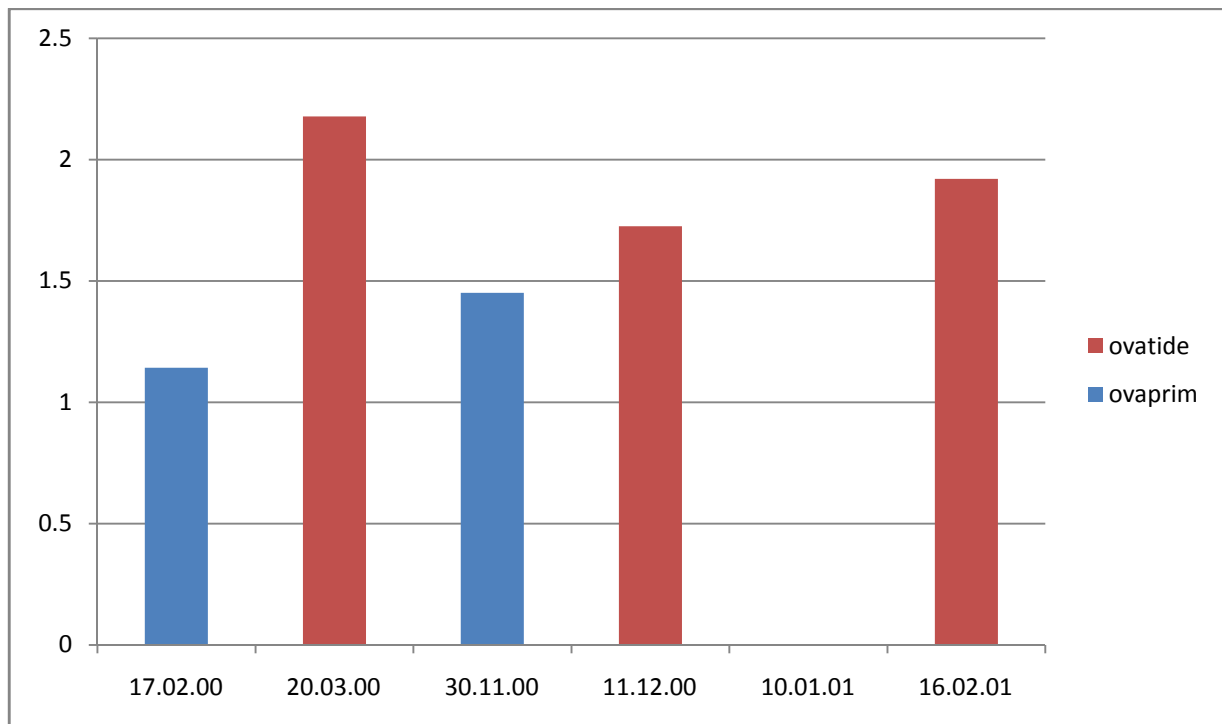


FIG.1 AVERAGE SPAWN PRODUCTION IN COMMON CARP USING SYNTHETIC HORMONES

