

## RESEARCH ARTICLE

### Effects of Ovaprim Hormone on Induced Breeding of *Clarias gariepinus*

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#### ABSTRACT

This study was conducted to determine the artificial breeding with application of optimum dosage of stimulatory Ovaprim hormones. Female treated with T<sub>1</sub> (0.3), T<sub>2</sub> (0.4), T<sub>3</sub> (0.5), and T<sub>4(control)</sub> ml/kg/body weight. The result showed that stimulated with T<sub>3</sub> (0.5) obtained better eggs quantity (25006) followed by T<sub>2</sub> (0.4) (17,200), while the lowest quantity (8233) was in T<sub>1</sub> (0.3), but T<sub>4(control)</sub> was failed. The spawning hours, fertilization and hatchability, was significantly affected by three doses ( $P < 0.05$ ). The hatchability hours was not significantly affected by hormone doses ( $P > 0.05$ ). The survival rate was significantly affected by hormone doses ( $P < 0.05$ ). The highest survival rates (53.67%) observed in T<sub>3</sub> (0.5) followed by T<sub>2</sub> (0.4) (42%) while the lowest (32.67%) in T<sub>1</sub> (0.3).

**Key words:** Breeding, *Clarias gariepinus*, hormone, induced, Ovaprim

#### INTRODUCTION

*Clarias gariepinus* is an important fish species in aquaculture practices among Sudanese farmers. The preferably may refer to several advantages such as a wide feeding range, fast growth, resistance to low oxygen concentration, and high tolerance to environmental condition which is considerable easier for producers.<sup>[1,2]</sup> The only one source and supply of catfish fry and fingerlings is comes from natural resources, which is may result many problems such as mix species, size considered, diseases transfer, and growth stunting due to hardy adaptable to harsh environment.<sup>[3]</sup> This study was conducted to determine the effect of hormone on artificial breeding and to see the percentage of hatchability of fertilized eggs.

#### MATERIALS AND METHODS

##### Broodstocks

This study was conducted between June and July 2017 at Fish farm of Neelain University

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Faculty of Agricultural Technology and Fish Sciences, Khartoum, Sudan. The *C. gariepinus* used for the trial originally obtained from the White Nile. A total of 12 pair of sexually mature healthy broodstock 1 year old (1.4–1.6 kg) were collected. Fish were divided into four groups' three pair in each. The selected broodstock were sexually distinguished the readiness spawning on the basis of external features and release of eggs on gentle pressure on the abdomen as suggested by Verreth.<sup>[3,4]</sup> Selected fish treated with 1 mg/L KMnO<sub>4</sub> and kept in fiberglass tanks (250 L) with well aerated and conditioning environment for acclimatization period. Fish were fed with commercial catfish feed (35% crude protein) at 2% of their body weight daily. Water in each tank was gradually replaced every 24 h with fresh water.

##### Doses administration

One group was injected with Ovaprim hormone with T<sub>1</sub> (0.3), T<sub>2</sub> (0.4), T<sub>3</sub> (0.5), and T<sub>4(control)</sub> ml/kg/body weight The dose according to the.<sup>[5]</sup> Table 1 summarized the stimulatory substances and their doses and method of application. Various doses were followed in the experiment intramuscularly. The induction and administration of the hormones

dose were done between 6 pm and 7 pm in the same day. Each injected fish was returned into its tank.

### Egg and milt collection

Between 8 and 14 h after injection the stripping of matured eggs took place. The milt could not be obtained from the males by stripping, probably because of the testicular anatomy, a number of 18 male were sacrificed and their ready testes were collected and cut into several pieces and pressed gently by a cloth to collect the milt for immediately used. Before fertilization takes place, the total weight of eggs was measured, the numbers were count and the percentages to female body weight were evaluated.

### Fertilization

The stripped eggs and milt were mixed thoroughly in a plastic bowl with gentle shake for 5 min. Each stripped eggs was fertilized separately. The eggs were cleaned thoroughly 3 times with hatchery water to eliminate the dissolved matrix tissue or mucus and debris, any dead eggs.

**Table 1:** Substances used as ovulation stimulators, their doses, and method of application

Group	Ovulation stimulator	Dose per 1 kg of female body weight
1	Ovaprim	0.3 ml
2	Ovaprim	0.4 ml
3	Ovaprim	0.5 ml
4	-	Control

**Table 2:** Reproductive performance of *C. gariepinus* female treated with T1 (0.3), T2 (0.4), T3 (0.5), and T4 (0) ml/kg/B. wt (means±SE)

Parameters	Mean±SD			
	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>
Body Wt. before injection	1.4667±0.0.25	1.6367±0.60	1.38±0.0.15	1.6367±0.60
Body Wt. after injection	1.4533±0.24	1.6167±0.60	1.3467±0.15	1.6367±0.60
Egg weight (g)	13.33±5.77	20.00±10.00	33.33±5.77	0.00±0.00
Egg numbers	8233.33±1628.015	17200.00±5216.32	25006.67±2178.21	0.00±0.000
Spawning hours	14.67±1.52	11.00±1.00	8.00±1.00	0.00±0.000
Fertilization rate%	74.33±5.85	89.33±2.08	95.00±1.000	0.00±0.000
Hatchability rate%	78.33±9.504	80.33±2.082	84.33±4.933	0.00±0.000
Hatchability hours	37.167±1.2583	36.333±1.2583	37.500±1.3229	0.000±0.0000
Survival rate%	32.67±4.726	42.00±3.000	53.67±8.145	0.00±0.000

Means with same superscript letter have no significant differences ( $P>0.05$ ). SD: Standard deviation, SE: Standard error, *C. gariepinus*: *Clarias gariepinus*

### Incubation

Fertilized eggs were carried out in three fiberglass trays (30 cm × 30 cm), with nylon mesh net (0.8 mm) suspended at the bottom floor of the fiberglass for spreading of the fertilized eggs. Each tray in hatching system was equipped with an aerator and a water flow system.

### Hatchability

Hatching occurred after 32–37 h later. The hatching larvae depend on their yolk as feed source until completely absorbed within 2–3 days. In day 4, the tray was removed with the egg shells and unhatched eggs. Determination the stripped eggs weight, percentage of eggs weight, number of eggs, fertilization %, hatchability % and the survival rate % which used in this study it was according to Ibrahim.<sup>[1]</sup>

### Statistical analysis

The data of induced breeding were statistically analysis used SPSS program, by one-way analysis of variance to determine differences between the means.

## RESULTS AND DISCUSSION

The results of this study were used 0.5 ml/kg/fish Ovaprim for *C. gariepinus* for females and 0.2 ml/kg body weight for males; the fish were stripping successful. The spawning hours, fertilization and hatchability, was significantly affected by three doses ( $P < 0.05$ ). The hatchability hours was not significantly affected by hormone doses ( $P > 0.05$ ).

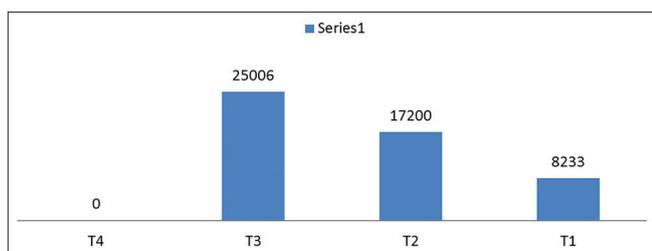


Figure 1: Treatment with eggs

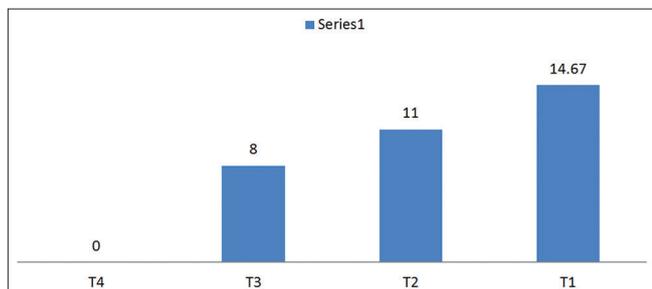


Figure 2: Treatments with spawning hours

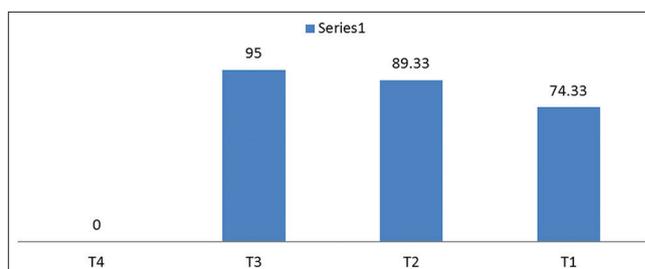


Figure 3: Treatments with fertilization rate percentage

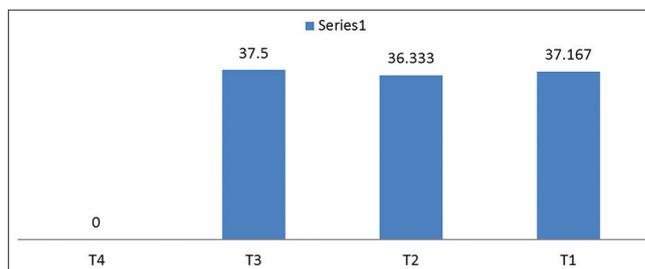


Figure 4: Treatments with hatchability hours

The survival rate was significantly affected by hormone doses ( $P < 0.05$ ) [Table 2]. These results agree with Salam *et al.*<sup>[6]</sup> studied induced spawning of major carp, they used Ovaprim (LC-RHa) a dose 0.5 ml/kg body weight for females and 0.2 ml/kg body weight for males, they explained that fish were spawned successful.

Naeem *et al.* (2005) injected carp fish by Ovaprim at 0.5 ml/kg/body weight for the females and 0.2 ml/kg/body weight for males to induce eggs and sperm release but in the present study used 0.5 ml of Ovaprim/kg body weight for the female. Eggs released after 13 h, males were given 0.2 ml/kg weight body but did not induce sperm release.

Adebayo<sup>[7]</sup> used Ovaprim 0.3 ml/kg for *C. gariepinus*. Eggs release occurred at 11–18 h later. In the present study, same results were obtained with Ovaprim at concentration of 0.3, 0.4, and 0.5 ml/kg fish weight. The present study agrees with Brzuska<sup>[8,9]</sup> who used successfully Ovaprim (0.5 ml/kg) body weight for females of African catfish, but he found that PG 4 mg/kg/body weight was not effective.

Results of the present study agree with that of Haniffa *et al.*,<sup>[10]</sup> and Sridhar *et al.* (2002) who found that Ovaprim at a dose of 0.5 ml/kg body weight of *Labeo* sp. given best results [Figures 1-4].

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