OVAPRIM DOSES EFFECTS ON EGGS OF AFRICAN MUDFISH 
CLARIAS GARIEPINUS

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ABSTRACT

Induced spawning of African mudfish Clarias gariepinus was conducted at different ovaprim doses, to observe the situation that will provide the highest number of eggs. Females of C. gariepinus were injected with different doses of ovaprim 0.5ml/kg, 1.0ml/kg and 1.5ml/kg. The fish in control experiment were injected with 0.0ml/kg of ovaprim. The eggs collected from injected fishes were fertilized with milt from male C. gariepinus. The fertilized eggs from fishes injected with 0.5ml/kg, 1.0ml/kg and 1.5ml/kg were placed in netting fabrics in bowls of water and were placed inside the laboratory. The results obtained showed that increase in the dosage of sGnRHa enhanced the production of more eggs and the highest number of eggs was obtained with 1.5ml/kg of ovaprim. It also reduced ovulation period. The fish that were injected with 0.5ml/kg produced the least amount of eggs and were stressed during the process of removal of eggs resulting in death. A dosage of 1.0ml/kg was recommended for artificial spawning of C. gariepinus for subsistence fish culture because the eggs oozed out directly with slight stroking of the belly of the fish and no mortality was recorded. 1.5ml/kg could be injected if the farmer has the facility to hold large numbers of larvae.

Key words: Ovaprim, Induced spawning, Dosage and Eggs

INTRODUCTION

Fish farming in Nigeria is on the increase, and this is due primarily to the fact that fish resource in the wild is being over fished. Fish farming systems are; ponds (concrete and earthen) cages and tanks. To encourage the growth of fish culture and to provide quality source of protein for the teeming community in Nigeria fingerlings production must be increased.

Fingerlings’ production is essential to fish farming, but the production of fingerling in Nigeria is associated with challenges: appropriate Ovaprim dose to be administered, environmental condition and availability of brood stock etc. Some of the reported works on the effects of Ovaparim on gonad maturation include: demonstration of high success rate in a tropical ornamental fish with topical application of reproductive hormones; ovulation was 92.8% and spermination rate was 97.5% (Hill, et al.,2005). Induced spawning, artificial fertilization and egg incubation were studied in Green Sturgeon and results showed that best treatment was GnRHa injected only in a single dose of 10µg/kg for males or a 1 µg/kg priming dose and a 19-µg/kg resolving dose for females(Van Eenennam, et al, 2008). Their findings also showed that the females were held at a temperature of 12-13° C and ovulation was after14± 3h after the second injection, and 49,000 to 115,000 eggs were collected from each female(Van Eenennam, et al, 2008) . The use of ovaprim as a spawning aid in ornamental fishes was surveyed in the United States, and they showed that some species
may not be responsive to the GnRHa in ovaprim or may require application under a different protocol (Hill, et al, 2009). Another reason reducing the effectiveness of ovaprim is the potential use in fishes that were not adequately conditioned or not matured. *Clarias batrachus* were injected with 0.5, 1.0 and 2.0 ml/kg body weight of ovaprim (Sahoo, et al., 2007). Latency period increased to 17 hours with 1-1.5ml of Ovaprim. They also showed that 1-1.5ml dose in combination to 14-17 hours latency are appropriate to reduce the deformed larva among the hatchery (Sahoo, et al., 2007). The effects of different doses of Ovatide were studied on the breeding performances of *Clarias batrachus* (Sharma, et al. 2010). They injected 0.6, 0.8, and 1ml/kg of Ovateide on *Clarias batrachus* and the total weight of the stripped eggs showed that fecundity was highest in1mg/kg of weight (Sharma, et al., 2010).

There is a paucity of information on the effects of different doses of Ovaprim on *C. gariepinus* in Nigeria. This study examines the effects of 0.0ml/kg, 0.5ml/kg, 1.0ml/kg, and 1.5ml/kg of Ovaprim on *C. gariepinus* fecundity. This is the first reported work, on different ovaprim doses on *C. gariepinus*, *Clarias* is the most cultured fish species in Nigeria, the hardy nature and resistance to adverse ecological condition enables its high density culture. It is hoped that results obtained in this study will elucidate the correct dosage of ovaprim for administration to the fish and advance the culture of *C. gariepinus* in Nigeria.

**MATERIALS AND METHODS**

*C. gariepinus* used in this study were purchased from a fish farm in Ilorin, Nigeria. The fish were acclimatized for one week.

**Identification of Matured Brood Fish**

Mature male and female fish were identified by observing their genital papillae, in a fully matured female the genital papilla is short, oval, slit-like and protrudes while in males the papillae is conical and tapered with a sharp reddish tip. The female is usually heavier than the male as its abdomen is distended with eggs.

**Administration of Dosages and Stripping**

Females of *C. gariepinus* were injected with 0.5ml, 1.0ml and 1.5ml of Ovaprim intramuscularly into the dorsal muscle above the lateral line, after the injection they were kept in the tank for 12 hours, the water level in the tank was reduced to the lowest minimum for conditioning of the fish. The fish were observed every 30 minutes for the release of the egg. The control experiment was injected 0.0ml/kg of ovaprim.

**Preparation of Milt and Eggs for Fertilization**

The testes of the male fish were dissected out, testes were cut into smaller pieces using scissors and washed with 0.9% saline solution and then sieved to remove dead tissues. The stripped eggs were collected in a clean bowl, and immediately the milt suspended in 0.9% saline solution was spread uniformly over the stripped eggs. The bowl was vigorously shaken for a few seconds to improve fertilization.

**Experimental Design**

Eggs stripped from fishes injected with different doses of ovaprim 0.5ml, 1.0ml and 1.5ml were placed in netting material in the water and the water was oxygenated with the aid of aerators. Three bowls containing eggs were placed inside the laboratory. The fish in the control experiment did not release any egg. Numbers of eggs in a subsample were determined by direct enumeration then the total numbers of eggs collected from the fish injected with different dosage were estimated. The mean number of eggs in 0.5 ml/kg, 1.0ml/kg and 1.5ml/kg were subjected to one way Anova (Zar, 1974).

**RESULTS**

The weight of the female fishes used in the study fluctuated from 500g -1,500g.

**Experimental Design**

The fish that were injected with 0.5ml and 1.0ml did not release eggs before 12 hours and the eggs were not released until pressure was applied to the stomach. Female fishes injected with 1.5ml of Ovaprim released eggs after 11 hours after injection.
Eggs oozed out directly before any form of pressure were applied to the stomach. 

**Fecundity**
Fish injected with 0.5ml of ovaprim had ripened eggs but fecundity was little. The total numbers of eggs were from 1,200 to 1,500 eggs as shown in Table 1.

Fecundity of *C. gariepinus* Injected with 1.0ml
The fecundity was higher in fish injected with 1ml of ovaprim, eggs were oozing out with a gentle stroke of the ventral belly of the fish. Estimated total fecundity using a numerical method were from 4,000 – 50,000 eggs. (Table 1)

<table>
<thead>
<tr>
<th>Dosage</th>
<th>No of fish</th>
<th>No of egg Range</th>
<th>Mean</th>
<th>S.D</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5ml</td>
<td>3</td>
<td>1200-1500</td>
<td>1350</td>
<td>129</td>
</tr>
<tr>
<td>1.0ml</td>
<td>3</td>
<td>40000-50,000</td>
<td>45250</td>
<td>4112.99</td>
</tr>
<tr>
<td>1.5ml</td>
<td>3</td>
<td>300,000—350,000</td>
<td>322,600</td>
<td>19590</td>
</tr>
</tbody>
</table>

**Experimental Design**
Hatching occurred at 12 hours, eggs stripped from fishes injected with 0.5ml/kg , 1.0ml/kg and 1.5ml/kg of Ovaprim hatched successfully.

**Survival of fry**
The larvae survived after hatching, and about 90% survival were observed in all the doses.

**DISCUSSION**
Salmon gonadotropin releasing hormone analogue sGnRHa (ovaprim) successfully induced spawning in *C. gariepinus*. The dosage administered influenced the fecundity of the fish. The result is consistent with the observation of (Hill, *et al.*, 2009) that ovaprim may require application under different protocol. The increase in dosage resulted in more eggs being produced and this varied with the size, similar results were obtained in *C. gariepinus* and *C. batrachus* respectively (Bruton, 1979; Sharma, *et al.*, 2010). The

![Larvae survival on different doses of ovaprim.](Graph.png)
bigger the fish the more the total number of eggs that was produced and the sGnRHa did not have an adverse effect on the female fish because they resumed normal activities after stripping. This result is consistent with the result of (Sahoo, et al, 2007), they showed that increase in dosage resulted in more larvae.

The control experiment did not release any egg. 

The latency period was 12 hours in fish injected with 0.5ml and 1.0ml of ovpaprime while it was 11 hours in fish injected with 1.5ml of ovpaprime. Increase in the dosage of ovpaprime reduced the latency period in this fish. Other factors such as fish species and the type of hormone may be responsible for the different latency periods observed in fish. A latency period of 17 hrs was obtained for Clarias batrachus when injected with 1 - 1.5ml/kg dose of ovpaprime(Sahoo, et al, 2007). In the present work the latency period observed was lower than the result obtained by Sahoo, et al, 2007, indicating that latency period varies with fish species. About 90% of eggs of Oxyleotris marmorata hatched and survived (Tam and Lam 1973), the result obtained in the present study is consistent with the result of (Tam and Lam 1973).

This work has shown that treatment of C. gariepinus with sGnRHa injected in a 1.0ml/kg and 1.5ml/kg enhanced the production of matured eggs in C. gariepinus. The eggs oozed out freely without much pressure on the fish and the fish survived after stripping. The dosage of 1.0ml/kg produced manageable number of eggs for subsistence fish farming. However, a farmer with facilities that could hold large number of eggs could inject the fish with 1.5ml/kg because more eggs would be produced. It also reduced the latency period. Female C. gariepinus injected with 0.5ml/kg released less eggs and the fishes were stressed because much pressure was used to forced out the eggs resulting in mortality.

REFERENCES