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Effect of Induced Breeding of *Clarias lazera* using Hormones of HCG

Ahmed Mohammed Musa Ahmed

Department of fish Sciences, Faculty of Agricultural Technology and Fish Sciences, Neelain University- Khartoum- Sudan

ABSTRACT

This study was conducted to determine the artificial breeding performance of optimum dosage of hormones HCG to induce spawning in Clarias gariepinus at a hatchery. Three doses were prepared first treatmentT1(3000IU),second treatmentT2(2000IU), and finally treatmentT3(1000IU). Fish Body weight before injection with no significant($p>0.05$). after injection there was significant between treatment ($p<0.05$) .spawning hours happened after 6 hours in treatmentT1 , followed by T2 after 9 hours , finally T3 after 10 hours. Eggs weight g was best in T1(63g), followed by T2(25.67g) and finally T3 (9.67g) .The result revealed that fish stimulated with HCG obtained better eggs quantity was in the first treatment T1 (22313) followed by T2 (16443), finally T3 (8410) there was no significant between treatments in The fertilization rate %., Hatchability% , hatchability rate and survival rate ($p>0.05$).

Keywords: induced , Breeding, Clarias gariepinus,

***Correspondence to Author:**
Ahmed Mohammed Musa Ahmed
Department of fish Sciences, Faculty of Agricultural Technology and Fish Sciences, Neelain University- Khartoum- Sudan
Mobil 0129427898

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INTRODUCTION

Induction of spawning using hormones provides a direct control over the final stages of the reproduction cycle in teleosts (Rottman et al, 1991). Induced spawning is sometimes used for fish which ovulate naturally in ponds but males and females do not reach gamete maturation stage at the same time. In this condition use of hormones for male and female cause the fish to release gametes at the same time (Elsayed*, 1994). Hormonal induction has been the subject of many recent reviews (e.g. Harvry and Hoar, 1979; Lam, 1982; Donaldson and Hunter, 1983; Crim et al, 1987). The physiological mechanisms involved in the final stage of oocyte maturation, ovulation and egg release have been thoroughly reviewed (e.g Fostier and Jalabert, 1982;).In Africa induced breeding started after the Second World War. The first successful production of fingerlings was that of Clarias garepinus (Chellcher in Ivory Coast and (Aliwa*,1982) in Egypt). In Sudan some trials to induce grass carp to breed by hormones were carried out between 1984 and 1985 at El shaggara Fish Farm (Fisheries Research Center) but did not give good results (Osman* ,1998).Clarias lazera of the family Claridae is generally considered to be one of the most important tropical cat fish species for aqua culture.. It could be produced in form of high quality cheap product. As an aquaculture species, it has a short production cycle with a low production cost. It can be raised in tanks, ponds, or any small water bodies and could be used successfully as a predator to control over reproduction of Nile tilapia cultured in pond.

Objectives of this study are:

-To determine the effect of different concentration of hormones HCG on fish eggs release.

-To obtain optimum dose in hormones HCG.

Material and Methods

This study was conducted between june- July 2017 at Fish farm of Neelain University 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. Females and males were kept in separate happas (1.25 × 1.5 × 3 m) . Selected fish treated with 1mg/L KMnO4 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 hours with fresh water. After the acclamization , the studied fish were weight individually and their lengths were measured.1ml sterile water was injected in each of the vials, containing the powdered HCG (3000, 2000, and1000 IU).

brood stock size was (945-948g). Fish were divided in to four groups 3 pair in each. The selected brood stock were sexually distinguished the readiness spawning on basis of external features and release of eggs upon gentle pressure on the abdomen as suggested by Verreth. (1993).

Doses administration:

One group was injected with HCG hormone with T_1 (3000IU), T_2 (2000IU),and T_3 (1000IU) ml/kg/body weight The dose according to the (Fermin and Volivar, 1991).

Egg and milt collection:

Between (6:30 – 10:30 hours) 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 24 male were sacrificed and their ready testes were collected and cute into several pieces and pressed gently by a cloth to collect the milt for immediately used. Before fertilization take place .the total weight of eggs was measured, the number were count

and the percentage to female body weight were evaluated.

fertilization

The stripped eggs and milt were mixed thoroughly in a plastic bowl with gentle shake for five minutes. 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

Incubation

fertilized eggs was carried out in 3 fiberglass trays (30×30cm), with nylon mesh net (0.8mm) 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 – 34 h later. The hatching larvae depends on their yolk as feed source until completely absorbed within 2 to 3 days. In day 4 the tray were removed with the egg shells and un-hatched eggs. Determination the weight of stripped eggs, the percentage of eggs weight to female body weight, the number of eggs, fertilization %, hatchability % and the survival rate % according to Ibrahim (2016).

Statistical analysis:

The data of induced breeding were statistically analysis used SPSS program, by one way Analysis of Variance (**ANOVA**) to determine differences between the means.

Results and Discussion

The results of this study was used three doses o HCG the best was 3000IU,2000IU, and 1000IU. /kg/fish *Clarias gariepinus* for females .the fish were stripping successful. The spawning hours, was significantly affected by three doses **(p<0.05**). The Hatchability hours ,fertilization , and survival was no significantly affected by hormone doses(**p>0.05)**Table (1). Thalathiha et al (1988), Carreon et al (1976) and Aliwa (1982). Sahoo et al (2008) injected Asian cat fish by HCG 3000 IU per kg body weight the fish were stripped after 11 hours but in this study stripped happened after 6 hours with dose of 3000IU but dose of 1000IU fish stripped after 10 hours . Rowland (2003) injected Australian fresh water fish Murray code and Maccullochella peedi by HCG (1000, 2000 IU) / kg body weight, stripping occurred after 6hours The results of this study showed hatching occurred after 32-34 hours.. Brzuska E. (2003) ,Adebayo, O.T. (2006)their study agree with this study that tripping occure after 7-10 hours. FAO (1980) reported that the spawning time for Chinese carp, depends mainly on temperature of culture water; optimum 25 C^o - and maximum 31 C^o , this result agrees with the present study. Haniffa (2002) used HCG (1000, 2000, and 3000IU) 1ml/kg body weight of C punctatus, hatching occurred after 34 hours.

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Table (1): Reproductive performance of *C. gariepinus* female treated with T_1 (3000IU), T_2 (2000IU), T_3 (1000IU) HCG/kg/B.Wt(Means ± SE).

Treatments			
Parameters	**T_1** (Mean ±SD)	**T_2** (Mean ±SD)	**T_3** (Mean ±SD)
Body Wt before injection	$945^{a} \pm 4$	$944.33^{a} \pm 4.1$	$948.33^{a} \pm .3.8$
Body Wt after injection	$882^{a} \pm 5.6$	$918.67^{b} \pm 4.2$	$938.67^{c} \pm 5.9$
Spawning hours	$6.33^{a} \pm 0.58$	$9^{b} \pm 1.0$	$10.33^{bc} \pm 0.58$
Egg weight(g)	$63^{a} \pm 5.6$	$25.67^{b} \pm 4.2$	$9.67^{c} \pm 2.1$
Eggs numbers	$22313.33^{a} \pm 1578.3$	$16443.33^{b} \pm 1042.6$	$8410^{c} \pm 451.3$
Fertilization rate%	$86^{a} \pm 1$	$85^{a} \pm 2$	$87^{a} \pm 4$
Hatching time	$33.67^{a} \pm 1.5$	$32.67^{a} \pm 1.5$	$34^{a} \pm 1$
Hatchability rate%	$82.33^{a} \pm 1.5$	$83.67^{a} \pm 1.5$	$82.67^{a} \pm 2$
Survival rate%	$92^{a} \pm 1$	$91^{a} \pm 0.0$	$91.33^{a} \pm 1$

Means with same super script letter has no significant differences (p>0.0