Feminization Of *Oreochromis Niloticus* Using *Diethylstilbestrol*

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ABSTRACT

Oreochromis niloticus (Nile tilapia) is one of the best choices for fish farmers. It is tolerant to adverse environmental conditions, it can survive at low dissolved O_2, it is euryhaline, relatively fast growing and efficient in food conversion. However, it requires sex reversal for mono-sex culture, and particularly feminization of Oreochromis niloticus using diethylstilbestrol. Sex reversal can be achieved by harmonized fish feed. After four months of feminized fish, randomly sampled Oreochromis niloticus were dissected for gonad observation through compound microscope in the Zoology Laboratory at Masinde Muliro University of Science and Technology. The gonads were stained using a certocamine to make the observation possible. The pond with only females was a confirmatory of the right hormone concentration to be used. This study was to determine the right hormone concentration to feminize Oreochromis niloticus. Oreochromis niloticus was feminized by yolk sac fry immersion into Diethylstilbestrol for ten minutes, and then transferred to the ponds till yolk sac absorption. The fish was stocked into 4 ponds (0.8 x 1 x 1.4 M) at different Diethylstilbestrol concentrations. Diethylstilbestrol concentration was finally found to be 5mg for Oreochromis niloticus feminization. Water was pumped into the ponds from a water reservoir tank through horse pipes and individual ponds received their water independently It was concluded and recommended that right hormone concentration should be 5 mg for farmers and hatchery dealers.

1. INTRODUCTION

Fish farming can generate high interest and excitement. It has great potential to produce high quality protein in relatively short time periods and in small areas. Fish farming is one way that resource poor farmers throughout the world can provide protein that is often lacking in the family diet and too expensive to purchase (Dennis Murnyak, 2010). Pandian and Varadaraj (1990) indicated that the main setback in the world-over tilapia farming is the early maturation and reproducing so quickly resulting in overcrowding and stunted growth.

Sex reversal can be done in many fishes. It involves treatment of fish with hormones that can functionally override the genetic sex. Estrogens or androgens are therefore used in fish farming to manipulate gender (for example, if one sex is preferred for any reason), but as pollutants they can be serious threats to natural populations. (Stelkens RB and Wedekind C., 2010).

It is therefore important to study the fate of fish populations that live in heavily polluted rivers to learn more about the damaging effects of estrogens, especially when migration barriers leave fish populations with essentially two options (Stelkens RB and Wedekind C., 2010) to cope with the problem (Stelkens RB and Wedekind C., 2010).

Culture of monosex progeny, preferably males, which, in tilapia species, grow faster and to a larger size than females, have long been recognised as the most effective solution to the widespread problem of early sexual

maturation and uncontrolled reproduction in tilapia culture. To date, this has been achieved either through manual sexing, direct hormonal sex reversal or hybridization, the relative merits of which are reviewed by Mair and Little (1991) and Wohlfarth (1994). All of these techniques have significant disadvantages in their application and none has become widely used in aquaculture, especially in developing countries. This is in contrast to the widespread culture of monosex female salmonids produced through genetic management (Bye and Lincoln 1986). This study therefore was to determine the right hormone concentration (*Diethylstilbestrol*) for *Oreochromis niloticus* feminization.

2. MATERIALS AND METHODS

This study took place at Munyanya, Kakamega County, Kenya. *Oreochromis niloticus* yolk sac fries were obtained from the Fish Farmer Ponds, Kakamega County. The fish were stocked into 4 ponds in the open field at different hormone concentrations. Water was pumped into the ponds from a water reservoir tank through horse pipes. Individual ponds were receiving their water independently. Feminization was done by immersing yolk sac fry in *Diethylstilbestrol* (DES) for 10 minutes. The yolk sac fry was transferred to the ponds up to the completion of yolk sac absorption. The fry was then stocked into three ponds. After four months of feminized fish, randomly sampled *Oreochromis niloticus* were dissected for gonad observation through compound microscope in the Zoology Laboratory at Masinde Muliro University of Science and Technology from each of the three ponds. The gonads were stained using a certocamine to make the observation possible. The pond with only females was a confirmatory of the right hormone concentration to be used.

3. RESULTS, DISCUSSION AND CONCLUSION

Table 1: Treatments per group with different hormone concentrations

Control Group	
Males	78
Females	72
0.003g	
Females	135
Intresex	15
Males	0
0.005g	
Females	150
Males	0
0.007g	
Females	150
Males	0

The right hormone (*Diethylstilbestrol*) concentration for *Oreochromis niloticus* sex reversal to all females was found to be 0.005g (5mg). It was found that 3 and 7mg was a waste. Intersexes were found at 3mg while 7mg all were females as in 5mg. See Table 1 above.

Dennis Murnyak, 2010 reported fish farming is one way that resource poor farmers throughout the world can provide protein that is often lacking in the family diet and too expensive to purchase. Pandian and Varadaraj (1990) reported that a major drawback in the world-wide culture of tilapia is the precocious maturation and uncontrolled reproduction resulting in overcrowding and stunted growth. This research has provided a solution by understanding the right hormone concentration for Oreochromis niloticus feminization using *Diethylstilbestrol.* By producing feminized females (XY) solve the problem of the early maturation and fast reproduction resulting in overcrowding and stunted growth, cited by Pandian and Varadaraj (1990).

The significant disadvantages reported by Mair and Little (1991) and Wohlfarth (1994) has been removed by this research.

In conclusion, the right hormone for feminization using *Diethylstilbestrol* was found to be 5mg. We therefore recommend the use of *Diethylstilbestrol* at the rate of 5mg to do feminization of *Oreochromis niloticus*.

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