

GROWTH AND SURVIVAL OF DIFFERENT SEX COMBINATIONS OF *Oreochromis niloticus* (L) IN GLASS TANKS

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ABSTRACT

Growth performance and survival rates of three different sexes of *Oreochromis niloticus* fingerlings (27.5±0.02g); mixed-sex, all male and all female fed 35% CP at 5% body weight was carried out for 56 days in indoor rearing operations. Aquaria tanks (60x30x 30cm³) were used as rearing tanks and each treatment was replicated. All female tilapia had the best specific growth rate (2.54%/day), food conversion ratio (1.98) as well as survival rate (98%), least value was obtained in treatment containing the mixed sex tilapia. Specific growth rate (2.06%/day), Food conversion ratio (2.27) and survival rate (95%).

INTRODUCTION

In Nigeria, *Oreochromis niloticus* is an important cultured fish species. It is a popular species, endemic to most part of the country and grown by many farmers (Maluwa and Costa-pierce, 1993). This species has cultural advantages characteristics such as ease of production, ready acceptance of artificial feed, fast growth, and adaptability to a wide range of environmental conditions. One of the major problems in tilapia culture is its highly prolific nature having early maturity which results in stunted populations because energy is being diverted to gonadal development instead of somatic growth (Gale *et. al.*, 1999). Also Africa "the home of tilapia", is yet to benefit as much from tilapia farming as other regions (Fagbenro, 2002b). Several approaches have being attempted to avoid this negative consequence of the prolific breeding of this species. Monosex culture of this species has been carried out by several authors (Jamjun and Yakupitiyage, 2004) to ascertain its advantage over the usual practice of mixed sex culture of tilapia, which necessitated this study.

MATERIALS AND METHODS

90 *O. niloticus* (mean wt., 27.50g) were obtained from the Hatchery Complex of the College and were randomly assigned to three different sex combinations; male and female (TRT I), all male (TRT II) and all female (TRT III). They were acclimatized for two days to enable them adapt to Laboratory conditions. The trial was conducted in nine aquarium glass tanks 60 x 30 x 30cm³ for fifty-six days. Ten fingerlings were stocked in each tank with three replicates per-treatment in a Completely Randomized Design. The fish were fed twice daily with a commercial feed of 35% Crude protein. The daily feeding rate of restricted rations 5% body weight was adjusted after weekly sampling. At the end of the experiment, all fish in each tank were counted and weighed separately using an electronic sensitive weighing balance OHAUS-LS5200 Model. Proximate composition of the feed was determined using standard methods (A.O.A.C. 1990). Moisture content was measured by drying the sample at 105°C in an Oven for 24hrs and ash content was estimated by burning the sample at 550°C in a muffle furnace. Crude protein was determined using the distillation unit of Kjeldahl system 1026. The following growth parameter indices were calculated according to method of Olvera-Nova *et. al.*, 1990. Specific growth rate (SGR) % = [ln final weight - ln initial weight] / time (days) x 100], Food Conservation Ratio (FCR) = Total amount of dry feed consumed (g) / wet weight gain of fish (g) and survival rate (%) = (final no of fish / initial no of fish) x 100.

RESULTS AND DISCUSSION

Growth response of the different sex combination of *Oreochromis niloticus* fingerlings, fed 35% crude protein are illustrated in figure 1. This study was carried out to compare the growth rate and survival of three different sex combinations of *O. niloticus* fingerlings, male and female, all male and all female. There was significant difference in the daily weight gain of combination of the different sex combination. All female combination had the best specific growth rate 2.54% per day, survival rate of 98% and food conversion ratio of 1.98. This could be as a result of better utilization of the feed administered. Highest growth rate obtained in all female could also be as a result of their high fecundity at the end of the experiment. However, results obtained from this study is in line with the findings of Puckhaber and Horstgen-Schurark (1996) that mixed sex *Oreochromis niloticus* had lower growth rate than all male and female. Water quality parameters such as dissolved oxygen, pH and temperature were 5.50mg/l, 7.60 and 26.00°C, respectively. These values were within the desirable range recommended for warm water fishes by Viveen *et.al.*(1986).

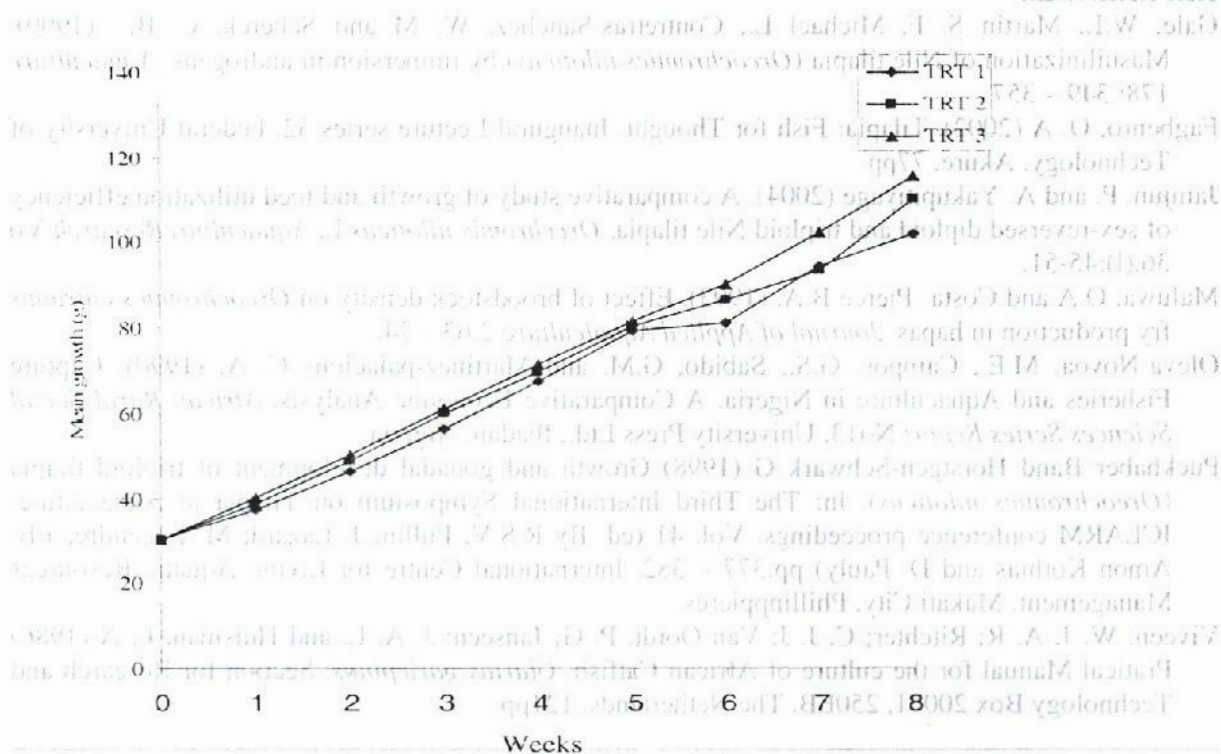


Figure 1: Growth response of different sex combinations of *Oreochromis niloticus* fingerlings fed 35% CP in glass tanks for 56 days.

Table 1: Growth parameters of different sex combination of *Oreochromis niloticus* fingerlings for 56 days

PARAMETERS	TREATMENTS		
	I	II	III
Initial body weight (g)	30.07	30.10	30.11
Final body weight (g)	102.09	110.08	115.62
Weight gain (g)	72.02	79.98	85.51
Daily growth rate (g/day)	0.96	1.35	1.42
Specific growth (%/day)	2.06	2.28	2.54
Food Conversion Ratio (FCR)	2.27	2.14	1.98
Survival rate (%)	95.00	96.00	98.00

Table 2: Proximate analysis of the experimental diet (%)

Components	Percentage (%)
Crude protein	34.32
Moisture content	9.85
Crude ash	28.00
Crude fat	2.00
Crude fibre	21.00
Nitrogen free extract	5.93

NFE is calculated as $100 - (\text{CP} + \text{ASH} + \text{CF} + \text{EE})$

Results obtained from this experiment showed that there were significant differences in food conversion ratio, specific growth rate and daily growth rate values of mixed sex tilapia and that of all male and female tilapia. All female tilapia are therefore suggested for commercial farming of tilapia.

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