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HEALTH CONDITION PROFILE (HCP) OF *OREOCHROMIS MOSSSAMBICUS* IN ASSESSING THE GROWTH RESPONSE UNDER INTENSIVE CULTURE SYSTEM

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ABSTRACT

Three groups of *Oreochromis mossambicus* with the initial weight (W) of 0.9260.1464 g. average total length (TL) 3.800 ± 0.308 cm, standard length (SL) 2.83 ± 0.280 cm, fork length (FL) 0.93 ± 0.1542 cm and body depth (BD) 1.16 ± 0.152 cm were kept in 1.5x 2.5x 1.5 feet glass aquarium for a period of seventy five days. All the specimens were fed with an experimental diet twice a day and measured fortnightly. It was noticed that the pattern of increasing in W, TL, SL, FL, and BD were negatively correlated while variations among all the growth variables were from 38-67%. This result indicates that the pattern of increase in body profile was significantly different than that of control.

Key words: *Oreochromis mossambicus*, Formulated diet, and Fish nutrition.

INTRODUCTION

In freshwater fisheries management and aquaculture, the use of artificial feeds are very common for the last fifty years. To obtain a productive ratio between rate of feeding and pattern of increase in body, careful monitoring must be undertaken. In order to develop such methodology, fish *Oreochromis mossambicus* (Tilapias) was used. It is endemic to Africa, but presently found in many tropical and subtropical regions of the world including Pakistan. Because of their high resistant abilities to tolerate extremes environmental conditions, like temperature, pH, salinities etc., they now become a favourable food fish in many countries (Lovshin, 1982). Several researchers including Lilongwe *et al*., (1996); Wohlfrath and Hulata (1983); Ahmed (1962); Naik (1969); Payne and Collinson (1983); Watanab *et al*. (1993) worked on the growth of Tilapia. The present study was carried out to investigate the health condition profile (HCP) which include the measurement of weight (W), total length (TL), standard length (SL), and fork length (FL) and body depth (BD) under intensive culture system. Study on HCP of *Oreochromis mossambicus* exhibited inconsistent results reared in Intensive cultural system with that of control.

MATERIALS AND METHODS

Feeding and rearing

The initial length of fish was recorded fortnightly and daily feed allowance (DFA) was calculated @ 5% of body weight as mentioned by Oseni (2000). The fish were fed twice a day at 0900 hours and 1600 hours. Aquaria were cleaned / siphoned by using 3 mm plastic aeration tube before feeding.

DFA=ABW x Stocking density x % Survival x FR
Where
ABW = Average body weight; FR = Feeding Rate (%)

Analytical procedure

Body profiles of all juveniles were measured fortnightly through out the study period (Seventy-five days). T.L, S.L, F.L and B.D were measured by using digital balance and vernier caliper having least count 0.01 mm. Pearson's correlation (r) and t-test (mean ± SD) and coefficient of variations (CV) were carried out by the formula given:

CV= 100x SD/mean as described in Novotny and Beeman (1990).

Experimental design

Locally available, low cost feed ingredients (Table 1) shrimps, squids, fish meal, fish oil, boiled rice, minerals, vitamin and salt were obtained from local market and the ingredients were mixed and added in warm water, thoroughly homogenized until the texture of the whole mass forms a stiff dough consistency. The dough was extruded through a hand pelletizer using 2-mm die. The dry pallets were broken into pieces of 1-3 mm size and were stored in airtight plastic bottle. Three groups of juveniles of *Oreochromis mossambicus* with the average total length

(TL) 3.800 ± 0.308 cm, standard length (SL) 2.83 ± O.208 cm, folk length (FL) 0.93 ± O.1542 cm and body depth (BD) 1.16 ± O.152 cm (Table 2 & 3) were stocked at the stocking density of 35 frys per aquarium having the dimension of 1.5 x 2.5 x 1.5 (Depth x Length x Width in feet). Before providing feed they were acclimatized for 48 hours and all aquaria were well aerated by an air line access.

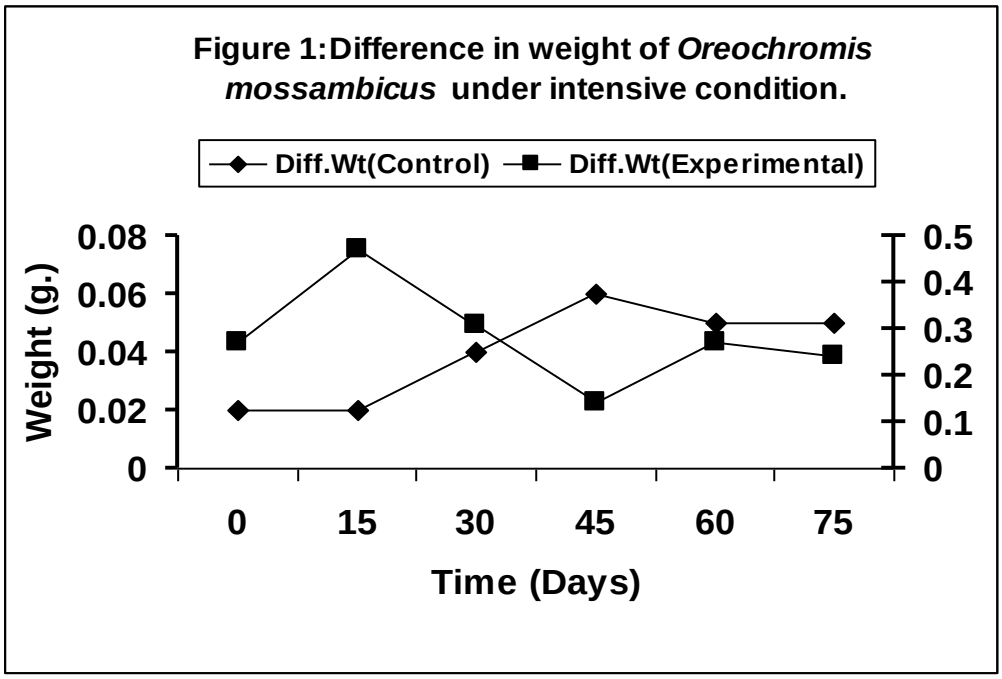

Fig.1. Difference in weight of *Oreochromis mossambicus* under intensive condition.

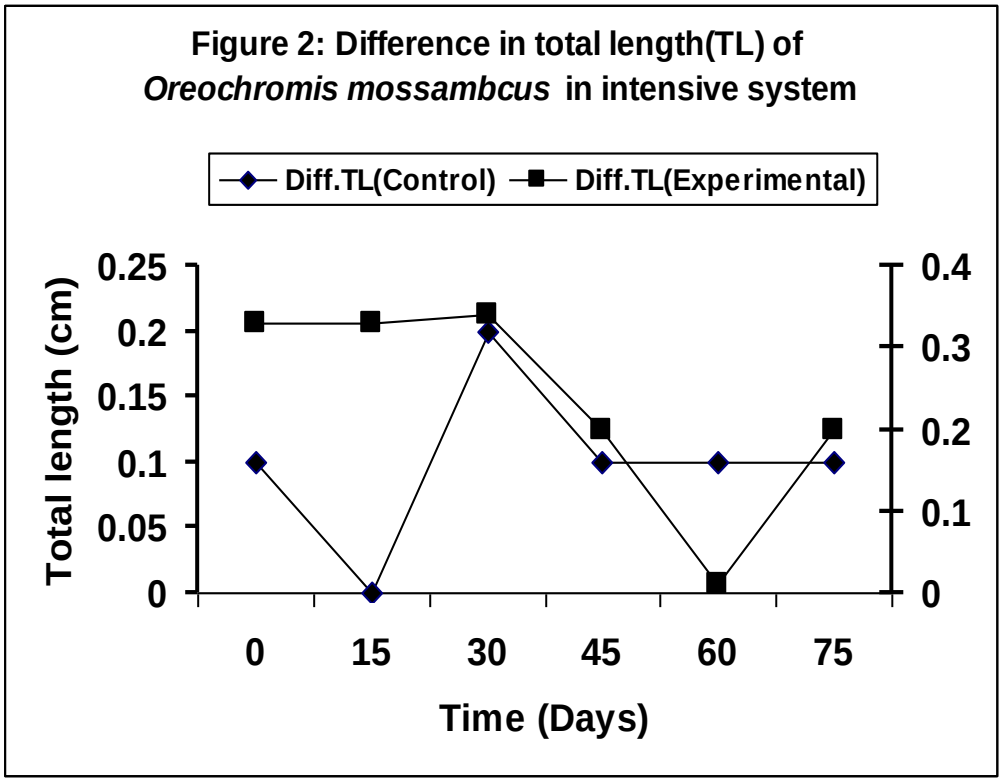

Fig.2. Difference in total length (TL) of *Oreochromis mossambicus* under intensive system.

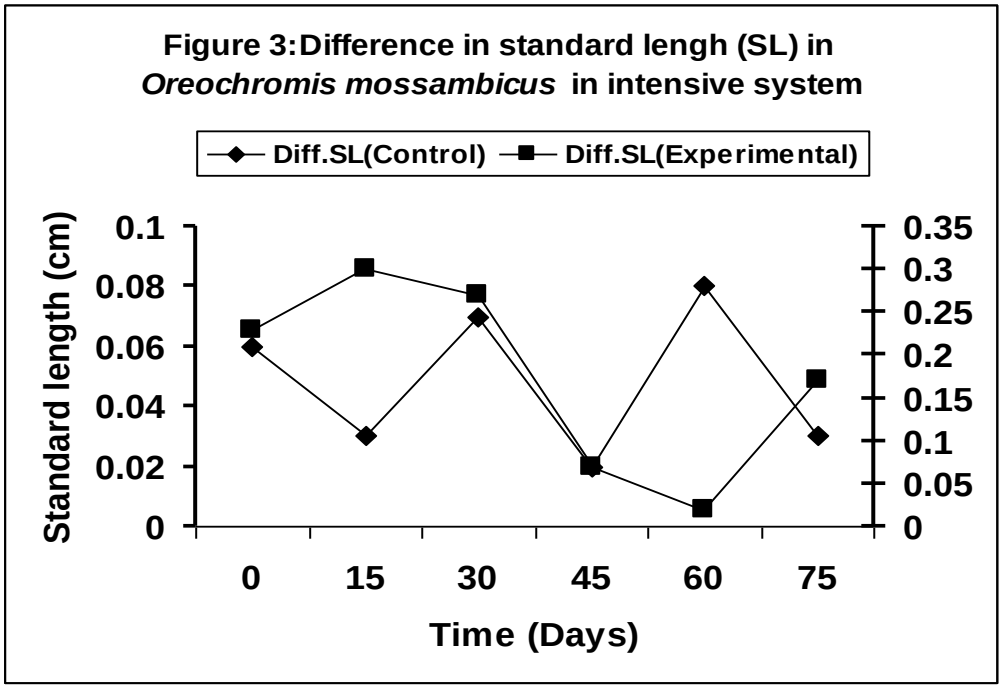

Fig.3. difference in standard length (SL) of *Oreochromis mossambicus* under intensive system.

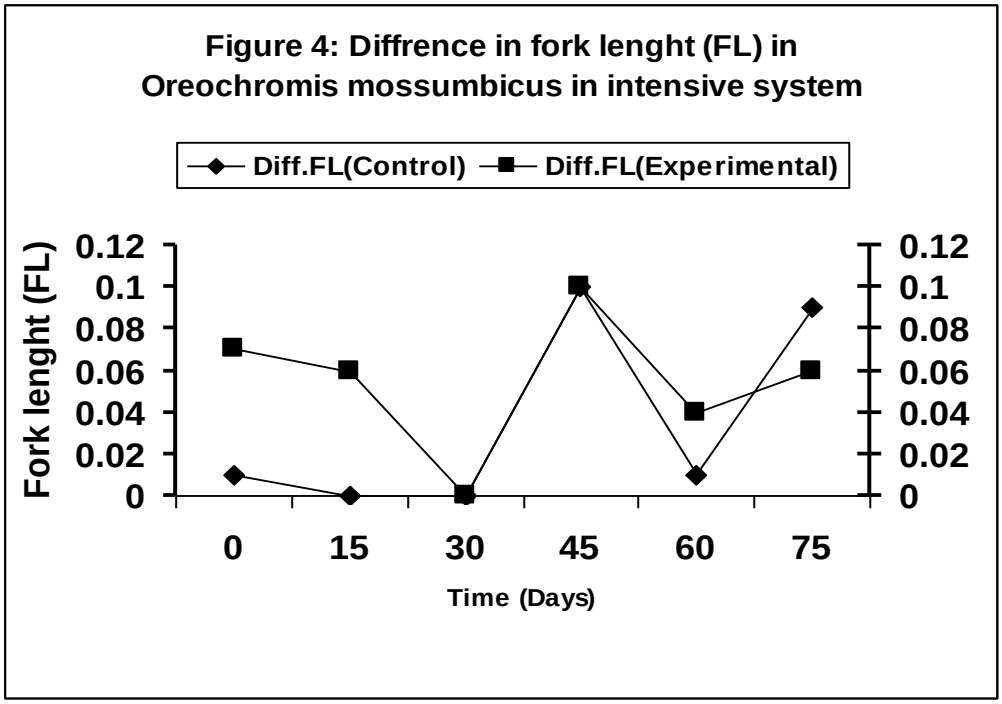

Fig.4. difference in fork length (FL) of *Oreochromis mossambicus* under intensive system.

RESULTS AND DISCUSSION

Observations for the health condition profile were grouped into three parts for assessment of growth: (1) Weighing (2) Measurement of total length, standard length, fork length, and body depth (3) Statistical calculation. Growth differences were fortnightly observed as major judgment of fish condition. The reasons for growth differences may be over feeding or high food conversion, favorable environmental condition i.e. suitable water

quality. Growth differences in combination with statistical calculation aid in the over all assessment of experimental fish.

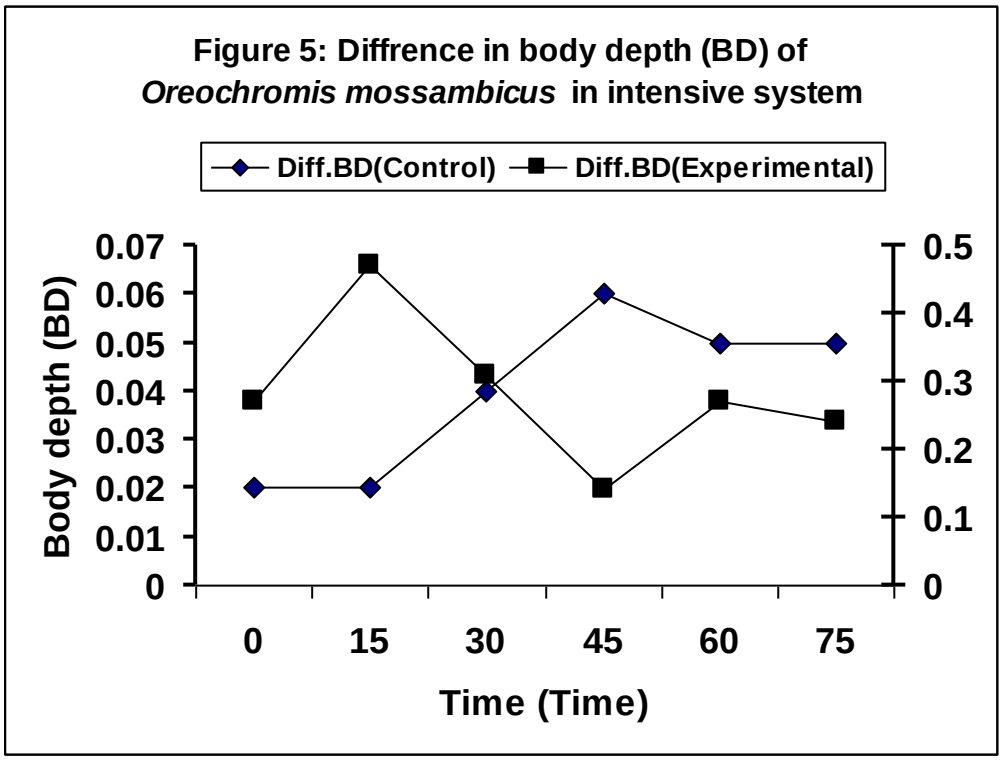

Fig.1. difference in difference in body depth (BD) of *Oreochromis mossambicus* under intensive system.

Table 1. Formulation and proximate composition of the experimental diet.

S.No.	Ingredients	Amounts per Kg
1.	Fish meal	200 gm
2.	Rice protein	530 gm
3.	Boiled rice	100 gm
4.	Squid	20 gm
5.	Shrimp	100 gm
6.	Salts	0.25 gm
7.	Minerals	0.05 gm
8.	Vitamins	10 gm
9.	Fish oil	40 ml

S.No.	Proximate composition	Amount in %
1.	Moisture	11.34 %
2.	Fats	2.65 %
3.	Ash	10.67 %
4.	Protein	47.0 %
5.	Carbohydrate	28.34 %
6.	Energy	325 K.cal/100 gm

As indices of health and condition, length and weight measurements provided a primary assessment of tested fish in this study. Length was more reliable indicator of growth over a particular period (seventy five days) because of the wide variation in fish weights, coefficient of correlation (r) and coefficient of variation (CV) ranged from -0.075 to -0.876 and 38 to 67% respectively (Table 1).Weight gain by the fish in through out the experimental period attributed to the quality of feed, frequency of feeding and feeding rate. The data pertaining to health condition profile including W, TL, SL, FL and BD were given in fig. 1-5. Coefficient of correlation (r) was calculated to correlate growth variables with reference to daily feed allowance (DFA) is shown in Table 1 indicating the value of (r) for W; -0.526; TL; -0.611, SL; -0.075, BD; -0.876 and regarding coefficient of variation (CV) as W, 38.12; TL, 54.5; SL, 63.38; FL, 60.54 and BD, 67.2% in intensive culture system. Studies involving various fish species have clearly shown the superiority of nutrients including better growth due to the presence of growth promoting factors (Andrews and Page, 1974; Tacon and Jackson, 1985). The diet containing a balance nutrient composition yields significant impacts on body profile of fishes. The findings of DeSilva *et al*., (1989); Santiago and Lovell (1988); Jackson and Capper (1982) and Chiayvareesajja *et al*., (1990) on Tilapias reflect the influence of formulated diets. The present results were a clear evidence for the varied degree of growth depending on the nature, source and composition of ingredients and their levels of inclusions. The growth pattern of experimental juveniles significantly different (**Fig.1-5**).W, TL, SL, FL and BD were statistically negative with respect to daily feed allowance (DFA) @ 5% body weight (Table 1). These findings indicate that the juveniles reared in intensive culture system grew rapidly because of the presence of nutritionally enriched ingredients, which were not available in the control.

Table 2. Coefficient of correlations(r) and coefficient of variation (CV) of *Oreochromis mossambicus* in intensive system.

	Coefficient of correlation (r)					Coefficient of variance (CV)				
DFA	Weight	TL	SL	FL	BD	Weight	TL	SL	FL	BD
	-0.526	-0.611	-0.49	-0.075	-0.876	38.12	54.5	63.38	60.54	67.2

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