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Effect of Different Feeds on Growth and Survival of Tilapia nilotica Reared in Cemented Cisterns

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Abstract: Studies on the effect of different feeds on growth and survival of Tilapia nilotica reared in cemented cisterns over a period of three months starting from March to May 2014. Three different locally available is ochloric (30% protein) feeds namely Pellet feed, Oryza feed and Soybean feed were applied as treatment I, II, III. Each cemented cisterns was stocked with ten fish having mean initial weight of 1.0 ± 0.5g was replicated thrice. Significantly ($p < 0.05$) highest weight gain, survival rate, specific growth rate and production was obtain in treatment III followed by treatment II and lowest in treatment I. Water quality parameters like temperature, pH, and dissolved oxygen (DO) and total dissolved solids (TDS) were recorded fortnightly and found within the suitable ranges of fish culture. On the basis of better growth and survival rate it is suggested that the soybean feed found to be best feed for growth and survival of Tilapia nilotica reared in cemented cisterns.

Keywords: Growth and Survival of Tilapia.

1. INTRODUCTION

Fisheries and aquaculture sector are playing important role to the world's feeding, livelihoods and prosperity. Fish meat is highly nutritive and free form fat especially in comparison to meat from terrestrial farm animals (FAO, 2012).Tilapia is culture specie of 21st century and known as an "aquatic chicken" (Altun *et al.,* 2006) because tilapia grows and reproduces in a wide range of environmental conditions (Tsadik and Bart, 2007). The successful aquaculture requires not only careful selection of species, appropriate feeding and water quality management but also a great extent (Akter, *et al.,* 2001). In this century increasing pressure of population with increase in demand of fish products resulted into high demand of fish and fisheries products. In our subcontinent various varieties of tilapia species are plenty in almost every water body which contains, that could be utilized by culturing of these fast growing species. For the successful rearing of fish species it is important to know their growth rate, food selectivity and amount of food required to produce a unit of weight gain. At present no information is available on feeding and growth performance of Tilapia nilotica.

2. MATERIALS AND METHODS

The live specimens of Tilapia nilotica body weight of 1.0 ± 0.5 g were collected from the cisterns adjacent to the Department. The experimental fish were acclimatized for fifteen days in cemented cisterns.

Ten cemented cisterns were maintained and designs as Treatment I, II, III and control, replicated thrice, Fortnightly water quality parameters from cemented cisterns were noted, the water of the cemented cisterns were exchanged.

Three type of food were supplied namely

Pellet feed (Treatment I)
Oryza feed (Treatment II)
Soybean feed (Treatment III)

In all the cemented cisterns Treated as Treatment I, II, III and control, feed was supplied twice a day at 8: AM and 6: PM morning and evening respectively at the rate of 8-5% body weight as reported by (Yasmin *et al.,* 1998). Sampling was done once in a month and weight was measured by electronic balance (Model No., CT, 1200-s, made in USA). After successful sampling feed ratio was maintained according to the weight of fish.

Statistical Analysis

One way analysis of variance (ANOVA) was used to determine the effects of different feeds on growth survival of Tilapia nilotica this was followed by Duncan (1995) at 5% level of significance to study any difference among treatment means.

3. RESULTS

Different feeds and their formulation which is used during study in different treatments are shown in **(Table 1).** The growth performance of Tilapia nilotica throughout study period was observed in relation to mean body weight at the time of experiment, mean weight at the termination of the experiment, mean increase in body weight, % of increase in weight, % of growth per day (Specific growth rate), and mortality rate and fish production (Kg/m2) were calculated. Expressively ($p<0.05$) maximum increase in body weight was 170.2± 0.8 acquired in experiment III, trailed in experiment II (60.1±0.5) and lowest exhibited in experiment I. % increase per day (SGR) resulted maximum and production were also high in treatment III (1.15 ± 1.5) and lowest was determined from treatment I respectively. **(Table 2, Fig. 1.).**

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Table.1. Proximate composition of different feed items used in cemented cisterns for growth and survival of Tilapia nilotica

Local feed	Crude protein	Rice bran	Wheat bran	Mustard oil cake	Vitamins	Salt	Atta	Moisture	Crude Fat	Crude fibre	DE MAC /KG	Phosp horus	Ash
	30%	2.5%	2.5%	3.0%	0.5%	0.1%	0.5%	-	-	-	-	-	--
Oryza feed	30%	-	-	-	-	-	-	10%	6%	5-6%	3.6%	-	-
Soyfeed	30%	-	-	-	-	-	-	-	6%	6%	-	0.9%	100%

Table 2 Data on growth and survival of Tilapia nilotica reared with different food items in cemented cisterns throughout the study period.

Parameters	T1	T2	T3
Mean Initial weight (g)	1.0 ± 0.5	1.0 ± 0.5	1.0 ± 0.5
Mean Final weight (g)	61.1 ± 1.9	51.5 ± 1.5	171.2 ± 1.8
Mean weight gain (g)	60.1 ± 1.9	50.5 ± 1.5	170.2 ± 1.8
% weight gain	611	515	171
SGR	0.92	0.88	1.15
Survival %	90	40	100
FCR	2.39	2.44	2.41
Production	1.80	1.51	5.10

TI= Treatment I. T2, Treatment II, T3=Treatment III
SGR= Specific Growth Rate, FCR+ Feed Conversion Ratio

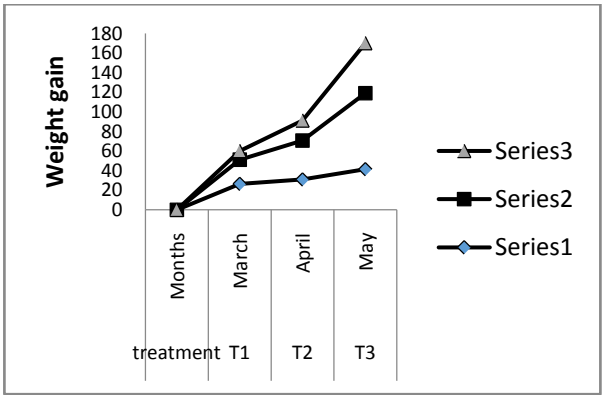


Fig 1. Showing weight gain of Tilapia nilotica reared with different food items in glass aquaria throughout study period.

4. DISCUSSIONS

During present investigations the maximum weight gain (170. 28) over the initial weight was observed in treatment III. Yasmin *et al.,* (1998) reported higher weight gain (793.1g) in Clarias batracus feed with chopped tubificid worms. The wide variation in the body weight gain is observed in case of tilapia seemed to be related with the species specificity. The lowest growth of experimental fish was observed in treatment I (pellet feed) is more or less similar to the finding of Jackson *et al.,* (1982) who observed reduce growth in tilapia (Sarotherodon mossambicus) at 30% crude protein of fish meal substitution by soybean meal. Rashid *et al.,* (1999) also reported similar observations on poor growth of Pangasius sutchi with low cast feed containing 29% crude protein. One of the reasons for poor growth performance of tilapia during the present study may be due to its genetic growth characteristics and adverse growing conditions under cemented cisterns situation. The highest growth rate was observed in the month of May when water temperature was in the range of (23.6-25^{o}C). In March substandard rate of growth (low) of Tilapia might be sudden low value of temperature of water. Aston and Brown (1974) reported that 22oC was the suitable temperature for growth of tilapias and Sadler (1979) concluded that the optimum temperature of favorable growth of all fishes to be ranged between 20-25^{o}C and the lethal temperature was 38^{o}C. The above findings are very close to the result of present study. On the basis of above Soybean feed is recommended as best feed throughout study period.

REFERENCES:

FAO. (2012) The State of the World Fisheries. Food and Agriculture Organization, Rome, Italy..

Duncan, D. B. (1995). Carp culture in net cages. FAO. Aquacult. Bull., 1-8.

Jackson, A. J., B. S. Capper and A. J. Matty (1982). Evaluation of some plant protein in complete diet for Tilapia at 50% level of fish meal substitution by soybean meal. Aquaculture, 27:97-109.

Yasmin, A., M., F. A. Mollah and G. S. Hylor (1998). Rearing of catfish (Clarias batracus Lin.) larvae with live prepared feed. Bangladesh J. Fish. Res. 2 (2): 145-150.

Sadler, K. (1979). Effects of temperature on the growth and survival of the European eel (Anguilla anguilla L.) J. Fish. Biol.15: 499-507.

Rashid, M. H., S. M. Rahmatullah and M. R. Aminv (1999). Preparation of low cast feed for cage culture of Pangasius suchi (Fowler) Bangladesh J. Fish19 (1) 45-52.