

PROBIOTIC INDUCED CHANGES IN THE PROTEIN CONTENT OF *ANABAS SCANDENS*

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Abstract: The present study was carried out in an indoor laboratory of Zoology Department of Ravenshaw University, Cuttack along with CIFA, Bhubaneswar. Initial body weight (IBW), final body weight (FBW), specific growth rate (SGR) were measured following formulation of Probiotic feed. The present research is an attempt to study the impact of Probiotic enriched diet on some of the physiological and biochemical indices of *Anabas scandens*. Standard methods were followed for analyzing Physico-chemical characteristic of water used in laboratory. Basic water quality parameters like pH, dissolved oxygen, Chloride, Ammonia, Alkalinity and free carbon dioxide were determined.

Keywords: Probiotic, Diet-1, Diet-2, SGR-Specific growth rate, IBW-Initial body weight, FBW-Final body weight.

Introduction

Aquaculture has become an integral tool for providing and fulfilling the protein requirement across the globe. With increase in demand and rapid industrialization, aquatic animals particularly fishes have become more susceptible and prone to diseases. The susceptibility to diseases has increased due to anthropogenic conditions. The use of Probiotic in aquaculture is targeted at minimizing disease, increasing resistance and enhancing feed quotient. Probiotics also improve water quality and control bacterial infections as they contain mixture of various bacterial species. The commonly used species are *Bacillus sp.*, *Lactobacillus sp.*, *Enterococcus sp.*, *Carnobacterium sp.*, and even yeast is used in the formulation of Probiotic diet. Probiotics improve the digestibility of nutrients and increase tolerance to stress. Bacterial infections cause more than 9% mortality in various fish hatcheries. Antibiotics and vaccines have been developed and are being used for the treatment of fish disease but they are not completely effective as many Bacteria causing infection to fishes develop resistance against specific antibiotic. Probiotic application is more cost effective in aquaculture industry. Amongst probiotic bacteria for aquaculture *Bacillus spp.*, *Lactobacillus spp.* and *Streptococcal spp.* are more widely used and have proved to enhance the health of aquatic animals (Gomez and Shen, 2008). *Bacillus* probiotic

supplement in shrimp feed (Rengpipat *et al.*, 1998, Ziaei-Nejad, 2006) has been experimented and after successful experimentation it has been expanding rapidly. Probiotic use induces immune stimulation and antimicrobial activities. In the present study probiotic has been used to understand growth change pattern in *Anabas scandens*.

Study Area

The study was carried out from January, 2011- January, 2012, in the Department of Zoology and CIFA.

Materials and Method

Ten fishes (Weight 15 ± 0.709 g) were transferred to the laboratory and acclimated to the basal diet for 14 days. Fishes were distributed into two duplicate groups as Control and Experimental. Aeration was provided by an air pump for each aquarium. Water was changed every 3 days and the fishes were fed at the rate of 3% of body weight three times a day (9am, 1pm and 5pm) for nearly 30 days. Two experimental diets were formulated (Table 1). The control diet [Diet-1] had no Probiotic supplement and Diet-2 was formulated with Probiotics. Diet-2 was supplemented at the rate of 0.1% with a bacterial mixture containing *Streptococcus faecium* and *Lactobacillus acidophilus*.

Ingredients (%)	Diets	
	Diet -1 control	Diet- 2 Experimental
Fish meal	99.50	99.50
Chromic oxide	0.50	0.50
Probiotics	0.00	10mg/kg

Table 1: Diet

Formulation

Result and Discussion- Various changes were observed in the growth rate of *Anabas scandens*.

A. Growth:

$$WG = FBW (g) - IBW (g)$$

$$SGR = [\text{In final body weight} - \text{In initial body weight}/\text{time (days)}] \times 100$$

DIET	IBW	FBW	WG	SGR (FBW-IBW/30 x 100)
CONTROL [DIET-1]	15 ±0.709	16 ±0.838	1 ± 0.129	3.33
PROBIOTIC FORMULATED FEED [DIET-2]	14±0.448	18±0.951	4 ± 0.503	13.33

B. The protein content of the liver (g/dL) determined to be:

Control = 5.46 ± 0.06

Treated = 5.74 ± 0.07

C. Glutamate Dehydrogenase:

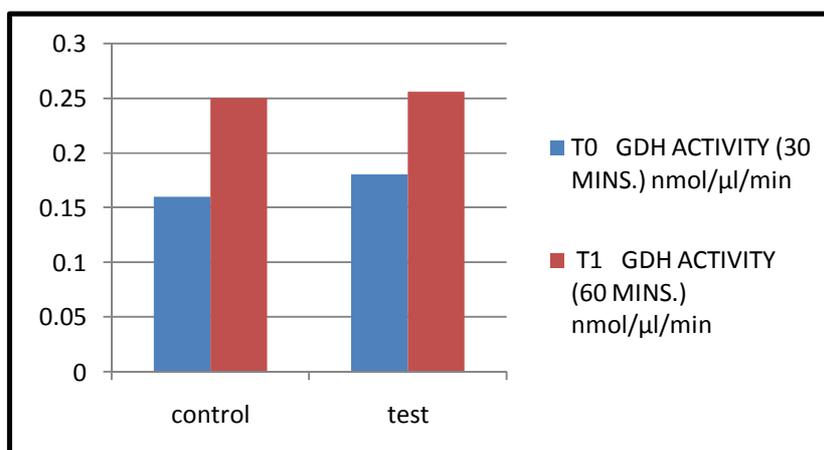


FIG-I: Comparison of GDH Activity between Control and Test at 30 Mins. and 60 Mins.

D. Digestive Enzymes:

(i) Protease Activity

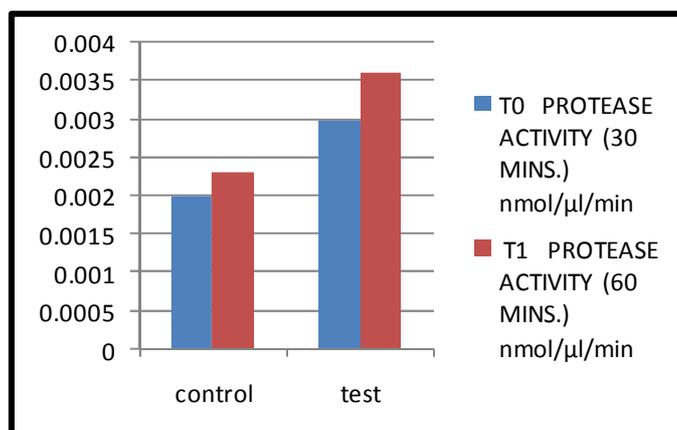


FIG -II: Comparison of Protease Activity Between Control And Test at 30 Mins. and 60 mins.

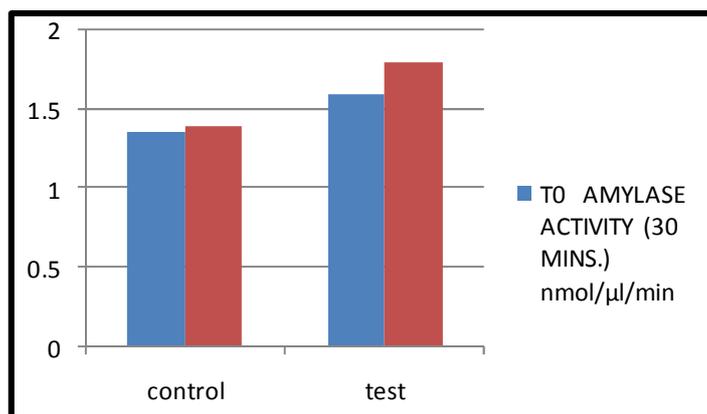
(ii) Amylase Activity

FIG- III: Comparison of Amylase Activity between Control and Test at 30 Mins. And 60 Mins

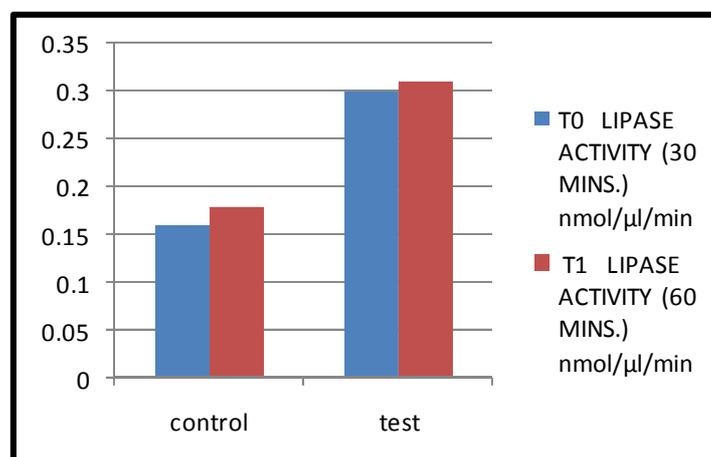
(iii) Lipase activity

FIG-IV: Comparison of Lipase Activity between Control and Test at 30 Mins. and 60 Mins.

Discussion

This study was undertaken to investigate the growth and survival of climbing perch under the influence of probiotics. The study carried out exhibited an increase in the final body weight of *Anabas* after probiotic incorporation in the diet. Similar findings have been confirmed by Abdelhamid *et al.* (1996). They worked on the addition of commercial additives in the feed which increased the body weight, feed efficiency and survival rate in broilers. Ahilan *et al.*, 2004 opined that probiotics influence the growth and gut Microflora in *Carassius auratus*. An increase in the GDH activity was observed when probiotics-induced diet was administered in the feed of *Anabas* and similar work has been shown by Prashanth *et al.*, 2008 on the Freshwater fish *Cirrhinus mrigala*. They observed that there was a steady rise in the GDH activity in the fish when the diet was formulated with probiotics. Probiotics treated fish

also exhibited an increase in the activity of digestive enzymes like protease, amylase and lipase and this result was supported and confirmed by various other studies. Some of them include the work of Mohamed et al, 2010 in which they observed the effect on *Nile Tilapia* and found an increase in the enzymatic activities.

Similarly, Ziaei et al, 2006; Taoka et.al, 2007; Wang 2007; Gomez et.al, 2008 have also proved that the administration of probiotics in the diet of shrimps and fish improved the activity of the digestive enzyme. The final weight, weight gain, specific growth rate, survival rate feed intake and protein efficiency ratio were increased among *A. scandens* fed on a diet containing probiotic, so it may be considered as a growth promoter in fish aquaculture. These results agree with Rengpipat *et al.* (1998) and Prabhu *et al.* (1999) that the probiotic treated group enhanced.

Conclusion

It is concluded that the addition of 0.1% Probiotic in *Anabas* diet improved animal growth, and mitigated the effects of stress factors. The two bacterial strains used in the present study were effective in stimulating fish performance.

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