

## **EVALUATE DIFFERENT FEED ADDITIVE WITH PROBIANTS ON GROWTH AND BIOCHEMICAL CHANGES OF *ETROPLUS SURATENSIS***

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### **ABSTRACT**

Aquaculture is the fastest growing food-producing sector in the world. One of the major constraints in the aquaculture industry all over the world is disease outbreak. In order to avoid all the problems scientist have selected certain beneficial microbes, so called probiotics which can be used as feed additives. As natural additives such as potato peel and sugarcane bagasse have much potential to increase the efficiency and sustainability of aquaculture production. The effect of natural feed ingredients and a mixture of fish gut probiotic bacterial flora *Bacillus* on the growth response of *Etroplus suratensis* higher than control diet was analyzed in this work.

**Keywords:** Probiotics, *Bacillus*, Potato peel, Sugarcane bagasse, *Etroplus suratensis*

### **INTRODUCTION**

Fish feed is the most expensive input in aquaculture operation. The shortage and high cost of pelleted feed severely constrained the development of low-cost aquaculture systems suitable for small scale farmers in the developing countries. It would therefore be more economical to utilize plant protein in fish feeding than high-cost animal protein materials. In the natural environment agricultural and aquaculture waste materials are available in large quantities. These materials are not wastes but waste resource, because they contain nutrients at varying level. A variety of substances, including many waste materials from the agriculture, food and rendering industries are recycled into feed for food-producing animals (Hao et al., 2006; Krishna, 1999).

Efficient and judicious utilization of these waste materials as a feed ingredient in aqua feed through microbial technology certainly pave the way for better management of these waste materials; which in turn reduce the pollution menace due to the disposal of these waste materials (Tovar-Ramirez et al., 2004). Hence, the present study was taken up to investigate the effect of probiotics and feed additives on growth response and biochemical composition in pearl spot, *Etroplus suratensis*.

### **MATERIALS AND METHODS**

A healthy *E. suratensis* was collected from the place Rajakkamangalam, Kanyakumari district, Tamil Nadu. The collected fish were kept in the laboratory and maintained the temperature and pH up to 2 days. The main feed on the fish was freshly made pellet diets and 50% water exchange was given daily. The branded

feed ingredients such as fish meal, groundnut oilcake, wheat bran, soya meal, tapioca powder, vitamin, mineral mix and cod liver oil were purchased from commercial merchants. Three different types of diets (Diet A, Diet B and Diet C) with 40% protein were compounded separately by mixing different ingredients with 2% potato peel powder (Diets A), 2% sugarcane bagasse powder (Diets B) and 2% CMC (Diet C) at various proportions. Then the probiotics Bacillus was added as feed additives at 1% in experimental Diet A and Diet B. Diet C was used as the control, without addition of probiotics.

## RESULTS AND DISCUSSION

After acclimatization, the healthy fishes were weighted individually ( $15.00 \pm 0.20$ g). They were reared at the rate of 3 numbers/ 12L water and fed ad libitum. During the experiment, which lasted 91 days, water quality was maintained.

### Growth Response

During the experimental period of 91 days, the Specific Growth Rate (SGR) of *E.suratensis* fed on Diet A was high ( $0.73 \pm 0.27\%$ ) and low in control diet (Diet C). The consumption rate of *E.suratensis* fed on control diet was maximum ( $38.62 \pm 0.86$ mg/g/day) (Table 1). The production rate of *E.suratensis* was high in probiotics Diet A fed group ( $14.2 \pm 0.17$ mg/g/day) whereas; it was low in control Diet B fed group ( $10.8 \pm 0.26$ mg/g/day). The present observation is in congruence with the findings of Paulmony (1996). He reported that the probiont yeast supplemented diet significantly influenced the growth, food conversion ratio and specific growth rate of *Cyprinus carpio*. Oyrin Olukunle (2006) was also reported that sweet potato meal was the best growth feed additives for fish production.

**Table 1: Overall growth responses of *E.suratensis* fed on Diet A , Diet B and Diet C during 91 days of feeding experiment**

Parameters	Growth responses		
	Diet A	Diet B	Diet C
Initial wt(g)	$15.0 \pm 0.60$	$15.00 \pm 0.70$	$15.00 \pm 0.20$
Final wt(g)	$29.2 \pm 0.45$	$26.70 \pm 0.18$	$25.8 \pm 0.75$
Production(g)	$14.2 \pm 0.17$	$10.20 \pm 0.35$	$10.8 \pm 0.26$
Food consumed(g)	29.70.83	$30.13 \pm 0.45$	$38.62 \pm 0.86$
FCE (%)	$30.96 \pm 0.76$	$33.85 \pm 0.45$	$27.96 \pm 0.65$
SGR (%)	$0.73 \pm 0.27$	$0.57 \pm 0.72$	$0.59 \pm 0.32$
FCR	$2.09 \pm 0.45^{ab}$	$2.90 \pm 0.24^{ab}$	$3.53 \pm 0.23^a$

## Biochemical composition

The overall results on variation in biochemical composition inferred that, it was much influence by both variation in *bacillus* supplementation and also additives. The protein, carbohydrate and lipid content of fish fed on Diet A were higher than Diet B and Diet C (Table 3). Among the biochemical constituents analyzed in the muscle, gill and gut samples were not differed much between fish fed with DietA and DietB and less in DietC fed fishes (Table 2). Valino *et al.*, 2004, studied the influence of the addition of a mutant strain of *Trichoderma viride* on sugarcane bagasse, to improve the digestion of the same through the cellulase enzyme system. Addition of probionts and feed additives in the diet increased the growth rate by accelerating the secretion of certain enzymes in fishes (Das, 1975).

Sogaard and Jessen (1990) reported that introduction of probionts particularly *bacillus* results in variations in the gut microbial composition. These changes in relation to the floras capacity to prevent infections must be regarded as a favorable increase of the *Lactobacillus* concentration, reduction of *E.coli* and as increase in the levels of organic acids. In the present study also, the same phenomina was observed in probiotic *bacillus* and feed additive potatp peel and sugarcane bagasse added experimental diet fed fishes after the feeding duration of 91 days.

**Table 2: Biochemical composition of muscle, gill and gut samples of *E.suratensis* fed on DietA, Diet B and Diet C**

Biochemical composition	Fish Samples								
	Muscle			Gill			Gut		
	Diet A	Diet B	Diet C	Diet A	Diet B	Diet C	Diet A	Diet B	Diet C
Protein	40.96± 0.14	35.14 ±0.15	33.46 ± 0.20	32.45± 0.14	29.15 ±0.13	27.15 ±0.12	27.36± 0.17	25.20 ±0.12	23.36 ±0.14
Carbohydrate	4.73± 0.01	3.09 ±0.01	3.06 ±0.01	3.42± 0.01	2.05 ±0.01	2.00 ±0.01	3.12± 0.02	2.10 ±0.01	2.25 ±0.01
Lipid	3.53± 0.02	2.23 ±0.01	2.86 ±0.02	3.12± 0.02	1.96 ±0.01	2.08 ±0.12	2.34± 0.01	1.70 ±0.01	1.82 ±0.01

## CONCLUSION

The present work proved the effect of various bacterial probionts and vegetable waste on increased growth of *E.suratensis*. The results will be further used in aquaculture industry for large scale production of *E.suratensis* under controlled environmental conditions. Furthermore, this work can be extended in aspect of application in various other fishes also using different sources of food waste.

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