

## Effect Of *Spirulina platensis* Probiotic Feed On Growth Performance Of *Poecilia reticulata*

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### Abstract:

*Poeciliareticulata* (Guppy) is an aquarium fish, added to stale water bodies to control mosquito populations. The dietary supplementation impact on *Spirulina platensis* probiotic strain on the growth performance was evaluated. Experimental groups 3 and one control group were maintained. The study was designed to evaluate the dried *Spirulina platensis* 0.5%, 1%, and 1.5% in diets for guppy fish. Guppies (E1, E2, and E3) were taken care of with the eating regimen supplement with *Spirulina platensis* probiotic, the development rate was critically contrasted with the control. The development rate was most noteworthy in E2 when contrasted with other test groups. The greatest development rate was seen in the E2 bunch enhanced with 1.0% *Spirulina*.

**Key Words:** Probiotics, *Poecilia reticulata*, *Spirulina platensis*.

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### Introduction:

Fishes in general, fascinate humans. The fishes which are colourful and with captivating movements are greater attention. The human urge to have fishes of this category, Whole habit of gracefully gliding through water closer to them as a soothing source of mental relaxation, gave birth to the practice of

keeping them as ornamental fishes in garden pools. Ornamental fish cultures one of the fastest growing industries. Probiotics can be portrayed as life frames that favor life.

Probiotics are helpful microorganisms that safeguard the host from ailments; According to Fuller (1992) portrayed probiotics as "live microbial feed supplements which gainfully influence the host by working on its digestive microbial equilibrium". Microbes play very important and critical roles in aquaculture. The most ordinarily utilized probiotic in creature nourishment is lactic corrosive microorganisms. ( *L.bulgaricus*, *L. acidophilus*, *L. sporogenes*, *L. casei*, *L. salivarius* *L. plantariurn*). Gatesoupe, 1994; Jobornet. et al., 1997; have been tried as supplement probiotics in warm-blooded creatures. Endeavors have likewise been made to utilize lactic corrosive microscopic organisms as hostile to the fish microbe. This research aims to obtain the application of different probiotics on the feed of *Poecilia reticulata* to support their growth.

#### **Materials and Methods:**

##### **Animal Description:**

GUPPY

Kingdom : Animalia

Phylum : Chordata

Sub - phylum :Craniata

Super class :Gnathostomata

Family : Poeciliidae

Genus : Poecilia

Species : reticulata

*Poeciliareticulata* are local to Trinidad and portions of South America, explicitly Antigua and Barbuda, Brazil, the US Virgin Islands, and Venezuela. Be that as it may, guppies have been acquainted with various nations on all landmasses, aside from Antarctica.

Guppy is suitable for beginners in aquarium keeping. This ornamental fish is very common with several varieties. Guppy fish with their glittering colours and more particularly when we feel tired and depressed.

The species thrives well at 22°-30° C in Water medium with pH of 7- 7.5. They breed every month and give birth 50-75 young ones every time. Its life span is three and a half years. Guppies have little stomachs and can just devour a smidgen of food at one taking care of. They eat almost everything.

#### **Experimental Design:**

The control feed was prepared using common ingredients like, Rice bran, Sesame oil Cake, Wheat flour, ground nut oil cake, multi vitamin tablet & cod liver oil which were procured from the local market in Thoothukudi. The feed was prepared with nearly 40% of protein. The above ingredients were mixed well with boiled water to make a dough. The dough was pelletized utilizing a manual pelletizer. The pelleted feed was dried under the sun and put away in hermetically sealed plastic containers for additional utilization. Guppies with a comparative weight ( $0.04 \pm 0.001\text{g}$ ) were chosen for the study and refined for a time of 35 days.

The probiotic *Spirulina plantensis*, as growth promoters were mixed to the feed to prepare an experimental feed denoted as E1 (0.5% *S.platensis*), E2 (1.0% *S.platensis*), E3 (1.5% *S.platensis*). The experiment of feeding trial with probiotic mixed diet to guppy fish was conducted in 12 plastic containers, each containing with 20 liters of fresh water 3 replicates were maintained for each treatment. The pre-arranged feed was taken care of to the guppy at the pace of 5% of body weight, threefold per day.

FCR = Amount of dry food consumed / live weight gain

SGR =  $\frac{\ln \log \text{ final weight} - \ln \log \text{ initial weight} \times 100}{\text{Experimental duration (35days)}}$

Weight gain = Final weight (g)-Initial weight (g)

#### **Statistical analysis :**

Statistical analysis was made by one way ANOVA to find out the significance at  $P < 0.05$  level among the experimental groups.

#### **Results and Discussion:**

The study evaluated that, (*P.reticulata*) were fed with 3 different concentration of feed viz., E1 (0.5%*S.platensis*), E2 (1.0%*S.platensis*), E3 (1.5%*S.platensis*) and control. Feed were given to test animal for a period of 35 days during feeding period the fishes accepted the different diets and variation in the growth of the fish was also noted. The weight of the experimental animal was taken at 1 week interval. The maximum weight gain was compared to that of the control. Experimental First day weight of the fish

was  $0.04 \pm 0.001$ g and the 35th-day weight was  $0.24 \pm 0.02$ g. Gained weight was maximum in E2 ( $0.200 \pm 0.09$ g) treated fish, followed by E1 ( $0.198 \pm 0.08$ g) and E3 ( $0.195 \pm 0.09$ g). The maximum specific growth rate was found E2 ( $5.117 \pm 0.17$ g), Which was followed by E1 ( $5.094 \pm 0.16$ g), E3 ( $5.094 \pm 0.16$ g). The best feed conversion ratio was observed in the E2 ( $2.00 \pm 0.09$ g) followed by E1 ( $2.020 \pm 0.09$ g), E3 ( $2.051 \pm 0.10$ g) and control ( $2.162 \pm 0.10$ g). Good survival was noticed in fishes that were fed with probiotics (E1, E2&E3) compared with the control group. The fishes that were fed with probiotic feed had a maximum growth and survival of 100% in E1, E2 & E3, and 97% in control.

Table 1 show the feed formulation of the basal diet:

S.N o	Ingredients	Percentage Incorporation (%)
1.	Wheat Flour	8.1
2.	Sesame cake	45
3.	Rice bran	6
4.	Grown nut oil cake	35.9
5.	Cod liver oil	2
6.	Multi vitamin	2

Table : 2 Growth performance of *P. reticulata*

Treatment	1 <sup>st</sup> day Weight (g)	35 th day Weight (g)	Total weight gain (g)	SGR	FCR	Survival (%)
Control	$0.04 \pm 0.001$	$0.225 \pm 0.1$	$0.185 \pm 0.09$	$4.934 \pm 0.15$	$2.162 \pm 0.10$	97
E1 (0.5%)	$0.04 \pm 0.001$	$0.238 \pm 0.02$	$0.198 \pm 0.08$	$5.094 \pm 0.16$	$2.020 \pm 0.09$	100
E2 (1.0%)	$0.04 \pm 0.001$	$0.240 \pm 0.02$	$0.200 \pm 0.09$	$5.117 \pm 0.17$	$2.00 \pm 0.09$	100

E3 (1.5%)	0.04±0.001	0.235±0.03	0.195±0.09	5.057±0.13	2.051±0.10	100
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SGR – Specific growth rate, FCR- Feed conversion ratio (FCR)

This study revealed that the effect of various Concentrations of *S.platensis* explained. E2 diet 1% of Spirulina as probiotics produced higher values of final weight, and specific growth rate than E1 and E3 fed a diet containing 0.5% Spirulina and 1.5% Spirulinaas probiotics respectively (table 2).

The effect of probiotics have been shown in a wide range of species for the promotion of growth, enhanced nutrition, immunity, and survival rate, The information is available on the use of probiotics in the diets of freshwater prawn, *Macrobrachium rosenbergii* (Suralikar and Sahu, 2001; Venkat et al., 2004). Bacteria *Lactobacillus sporogenes* and the yeast *Saccharomyces cerevisiae*, as a growth promoter, in the diet of *M. rosenbergii* post larvae and evaluate their growth performance and body carcass composition.

In aquaculture, the use of probiotics was gradually studied and demonstrated the ability to safeguard from pathogens and increased growth rates and welfare of farmed animals studied.(Gastesoupe 1991; Lara-Flores et al., 2003; Carnevali et al., 2004; Macey and Coyne, 2005; Wang et al., 2005; Wang and Xu, 2006). For commercial purposes use of probiotics development in aquaculture is a multidisciplinary process that required empirical and fundamental research, full-scale trials, and also economic assessment for future uses. When compared to the basal diet, all probiotic supplemented diets performed well for guppies' growth and survival Showed in table 2. In Indian major carps, similar results were observed by Ghosh et al., (2003) and Swain et al., (1996). Another report proved in Israeli carp by Noh et al., (1994) and Bogut et al., (1998) the commercial probiotic preparation of *Streptococcus faecium* improved growth rate and feed conservation rate.

The better FCR esteems saw with probiotic-enhanced weight control plans proposed that the expansion of probiotics further developed feed usage of normal carps. Comparable outcomes had been accounted for probiotics use in eats less carbs for weaned piglets (Close, 2000; Matijasic et al., 2004) and Nile tilapia (*Oreochromis niloticus*)(Lara-Flores et al., 2003). Abdel-Daim et al.,(2020), that spirulina showed powerful execution in the ingestion of feed via carps and was because of its dietary structure and bioactive mixtures.

Venkatramalingam K and Saravanan N (2020) said that the use of *S.fusiformis* (5%) in the feed of *C.catla* greatly instigated the particular development rate, weight gain, and length gain of the fingerlings. The current review demonstrated that the 1% of *S.platensis* initiated the greatest development pace of *P.reticulata*.

Shimaa A. Amer (2016) reported that 4 inclusion level of *Spirulina platensis* used for Nile tilapia fingerlings. Which indicated the 1% of spirulina were higher body weight and lower FCR than the other groups. Current study similar result were found in the growth of *P.reticulata*.

### **Conclusion :**

We can conclude that adding probiotics to the guppy staple food improved growth potential and feed utilization. The different concentrations of spirulina used in this study were effective in enhancing fish performance. Based on these results, it was recommended to use 1.0% spirulina in the guppy diet to increase productivity.

### **Acknowledgement:**

We acknowledge our thanks to UGC- STRIDE No.F.2-18/2019(STRIDE-I) for helping us in carrying out this research work.

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