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Effect of Ascorbic Acid Enriched Infusoria on Growth Rate of *Desi magur* (*Clarias batrachus*) Fry

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Abstract:- The present study was done to assess the effect of Ascorbic Acid on growth rate of *clarias batrachus* fry. The fry were fed with A.A enriched infusoria diet for a 60 days. Infusoria is given with ascorbic acid enrichment with different concentration i.e. 5%, 10%, 15% in different treatment T1, T2, T3 respectively with 0% enriched infusoria i.e. Non enriched infusoria in control group. The AA is added in infusoria through bioencapsulation. *Clarias batracus* fry of weight 2-3 gm and were randomly distributed in each plastic tank of 100 l. Initial and final weight was measured at every interval of 7 days. After the culture of infusoria Ascorbic acid is added at different concentration and fed to fry in each tank thrice a day. T3 shows highest weight gain and specific growth rate followed by T2, T1 and control group. Thus T3 shows highest growth and control group shows poorest growth in control group.

Keywords:- *C. batrachus fry, bioencapsulation.*

I. INTRODUCTION

The walking catfish, scientifically known as *Clarias batrachus*, is a well-known species. It possesses significant nutritional benefits, serving as a valuable food source due to its high protein content (14.87%). Additionally, it is an abundant source of polyunsaturated fatty acids (PUFA) and constitutes 25.6% of total lipid content among fresh cultivable fishes. Infusoria is a diverse group of microorganisms that includes ciliate protozoans, such as paramecium, euglena, volvox, vorticella, and many more. With over 2000 microorganisms falling under the classification of Infusoria, it serves as a valuable source of protein, essential for the healthy development of fry. When it comes to feeding young fry, which are often too small to consume brine shrimp or micro worms, infusoria ranging from 25 mm to 300 mm in size is an excellent food choice. It typically takes around 7 to 14 days for an Infusoria culture to mature and provide a sufficient feed source (Mukai, 2016). Ascorbic acid (AA) is a essential to the healthy development of many aquaculture species. In vertebrates, ascorbic acid is necessary for the formation of cartilage and collagen. It shields fish from stress and functions as an antioxidant. The lack of gulonolactone oxidase, an enzyme required for the final step of ascorbic acid production from glucuronic acid, is the cause of fish and crustaceans' nil endogenous ascorbic acid synthesis (Islam *et al*., 2019).

II. MATERIAL AND METHODS

- *Location of work*

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- *Duration of work*

The work will be conducted for a period of 180 days.

- *Experimental fish*

Desi magur (*Clarias batrachus*) fish fry.

- *Fish and Experimental condition*

Clarias batrachus fry with an average weight 2.5-4.8mg and an average length of 7-9 mm will be collected from nearby fish hatchery. Fish fry will be acclimatized for two weeks according to standard experimental conditions. During the period of acclimatization, Fish fry will be provided with a basal diet once a day.

Infusoria will be cultured at least 1 week before feeding it to fry. I began to feed Ascorbic acid enriched Infusoria. It takes between 5 to 7 days for an Infusoria culture to a population size that fits our purpose. Ascorbic acid enrichment in infusoria will be done. Enriched infusoriawill be feeded *(Clarias batrachus)* fry and feeding started to fry, fry will be fed 3 times a day. About 8 to 10% of its body weight without Ascorbic acid enriched infusoria in one tank and Ascorbic acid in different tank with variable 5 % , 10 % , 15 % in stable amount of infusoria. After feeding of infusoria, length and weight of different tanks was measured and observed under conditions.

- *Processing of Infusoria meal*

Banana peels will be used to cultivate infusoria. Store two or three banana peels in a large glass aquarium or jar with purified waters. for an aquarium that holds roughly water. Put a towel over the container. While allowing air to enter, it will keep flies and mosquitoes out. Store the container somewhere cool with plenty of natural light. The water may get milky and possibly smell bad in a day or two. There will be a slime layer on the water's surface. The water will become translucent and clear in four to five days, with a mild yellowish tint. The culture is now prepared to feed fish larvae in their early stages. If you routinely harvest the culture and add a few drops of milk, it can last for up to two or three weeks.

➢ *Growth Parameters*

The growth of fry will be measured at 7 days interval through measurement of length and weight of fish fry.

$$\text{Weight gain (\%)} = \frac{\text{Final weight gain} - \text{Initial weight gain}}{\text{Initial weight gain}} \times 100$$

$$\text{Specific Growth Rate (\%)} = \frac{\text{Final weight gain - Initial body weight}}{\text{Cultured period}} \times 100$$

➢ *Statistical analysis*

The collected data analysed by one way analysis of variance (anova) using microsoft excel. A significance level of $p<0.05$ was set to determine the significance of the influence of different treatment on the parameters. The means of the various treatments were compared using a one way ANOVA test to assess the significance of variation between the treatment means.

III. RESULTS & DISCUSSION

➢ *Weight gain (g)*

The weight gain of the fish fry was increased from 3.13±0.01gm to maximum weight 7.8±0.22 gm. Got average weight up to 7.87gm in 60 days whose maximum growth in specific growth rate is 7.833%. T3 shows highest weight gain and specific growth rate followed by T2, T1 and control group.

➢ *Specific growth rate (%) of C.batrachus fry*

The specific growth rate (%/day) Mean ± S. E ranged from 5.9 ±0.10% to 7.8 ±0.3% in the control group observed in table 1. The highest SGR (8.25%/day) as observed in was different in treatments higher in T3 followed by T2, T1, and the control group, respectively. The increase in weight is caused due to concentration of A.A in infusoria.

Table 1. The effect of different treatments on growth performance of walking catfish (*C. batrachus*) fry (Mean ± SE) during the 60days.

Variable	IW (gm)	FW (gm)	WG (gm)	SGR (%)
C	3.1 ± 0.01^{a}	6.7 ± 0.06^{c}	3.5 ± 0.05^{c}	5.9 ± 0.10^{c}
T1	3.1 ± 0.007^{a}	6.9 ± 0.12^{bc}	3.7 ± 0.1^{b}	6.3 ± 0.19^{b}
T2	3.1 ± 0.007^{a}	7.1 ± 0.07^{b}	3.9 ± 0.06^{b}	6.6 ± 0.10^{b}
T3	3.13 ± 0.01^{a}	7.8 ± 0.022^{a}	4.6 ± 0.21^{a}	7.8 ± 0.3^{a}

Values are mean of five observations. Value bearing different superscript differ significantly ($p<0.05$). Standard error is written along with their values.

Observed the value of initial weight gain (IW), final weight gain (FW), weight gain (WG), specific growth rate SGR (%/day) of different treatment with control group control with Mean ± SE value during the study period of 60 days. p value of all is $p<0.05$ means there is a significant difference between control groups and other treatments.

This results that the high concentration of ascorbic acid enriched infusoria shows more growth in fish fry comparing to less enriched infusoria diet. Thus, for a good growth rate high dose of ascorbic acid enriched diet is needed to *clarias* fry for maximum growth. The significance ($p<0.05$) difference between treatments and control group results in significant different

IV. CONCLUSIONS

Based on the information gathered from the present study, it can be concluded that feeding Desi magur fry with different concentration of ascorbic acid enrichment i.e. 5%, 10%, 15% in different treatments shows different growth respectively. Enriched infusoria led to an improvement in their growth rate. Weight gain ($p<0.05$) is affected by the 15%,10%, 5% infusoria ascorbic acid enriched diet thus higher the concentration of ascorbic acid higher the weight gain in the fry. Ascorbic acid play important role in growth of the *clarias* fry. The study showed that the fry fed with ascorbic acid enriched infusoria had a higher weight gain in 15% ascorbic acid enriched followed by 10%, 5% ascorbic acid enriched infusoria diet. Whereas, in SGR in 15% ascorbic acid enriched infusoria diet is higher followed by 10%, 5% ascorbic acid enriched infusoria diet and control group. Specific growth rate ($p<0.05$) shows significant variatons among control group and other treatment. Thus concluded that high concentration shows effective result on weight gain and specific growth rate.

This study showed that the fry fed with ascorbic acid infusoria with 15% concentration results significantly higher in growth from other treatment, there was significant difference in the growth rate of fry.

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