ORIGINAL ARTICLE

EFFECT OF DIFFERENT CONCENTRATIONS OF COW URINE ON GROWTH RESPONSE AND SURVIVAL RATE OF INDIAN MAJOR CARP, *LABEO ROHITA* FINGERLINGS(HAMILTON, 1822)

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ABSTRACT

The study revealed that the effect of Gir fresh cow urine on the growth response and survival rate of Indian major carp, *Labeo rohita* fingerlings. *L. rohita* were divided in to twelve groups and using cow urine. There are different concentrations like 100%,50%,25%,20%,10%,5%,4%,2%,1%,0.1%, 0.01%, 0.001%, control (without cow urine) in the medium for one week, a study was conducted various growth parameters was examined at 10th ,20th and 30th of post cow urine treatment days interval. Hence, the present investigation the effect of fresh cow urine was studied on growth and survival rate. The highest growth was recorded in 0.1% treated groups when compared to control. The result indicates significantly increased the growth, survival rate 0.1% concentration of fresh cow urine in *Labeo rohita* fingerlings.

Keywords: *Labeo rohita*, growth response, survival rate, Gir, fresh cow urine.

1.INTRODUCTION

In aquaculture the global production of fish and shellfish from capture fisheries has shown a steady increase over the last few years and recorded a production level of 121 million tons in 1996, with contributions of 94.6 million tons from capture and aquaculture, respectively (FAO., 1999).

Cow urine has been 'sushrita samhita', 'charaka samhita' and 'Ashtanga sangraha' as a most effective substances/secretion of animal orgin with innumerable therapeutic values (Charaka Samhita 1981; Sushrita Samhita,1985;Verreth,1991,Tietze,1996). Cow urine cure ameobiosis, dysentery, and diarrhoea, all problems due to gas, cough, swelling, stomach diseases, jauntice, spleen enlargement, ear diseases, asthma, constipation and anaemia.

Cow urine contains was iron, calcium , phosphorus carbonic acid, pottash, amino acids, enzymes, cytokine, lactose, nitrogen, ammonia, manganese, sulphur, phosphates, urea, uric acid, etc (Bhadauria,2002).

Labeo rohita is an important freshwater fish species normally cultured in Asia particularly in the Indian subcontinent (Abidi and Khan, 2004).This fish fetches a good market price and consumer demand. Modern aquaculture practices frequently expose fish to a variety of stresses that have the potential to negatively affect fish performance for survival (Barton 2000 & Dhama et al). The effects of stress can be manifested at several levels of biological organizations from sub cellular to individual, population and community levels by altering the plasma hormones, physiological activities such as ion osmatic function, metabolism and growth rates (Adams 1990, MC Cormick et al., 1998). Indian major carp, *labeo rohita* is one of the major preferred species in the Indian subcontinent which contributes about 35% of total carp production. Hence the present study's objective of stimulating growth of rohu with cow urine is heavy more social economic importantce.

2.METRIALS AND METHODS:

Acclimatization:

Fingerlings of *labeo rohita* were procured in healthy condition from S.M.Fish Farm at Swamimalai near Kumbakonam and transported to the laboratory in polythene bags filled with oxygen. In the laboratory, the fishes were acclimatized in plastic tubs of 20 L Capacity for two weeks. Excess of food removed and regular aeration and water filtration was provided to keep the experimental tubs clean and the experimental fishes healthy.

Collection of cow urine:

cow urine was collected from healthy cows of Gir free from any infection, maintained under medical supervision at Goshala in Sri Vital Rukmini Samasthan, Govindhapuram. Cow urine was collected in sterile container and was transported Immediately to the laboratory. The Gir urine was

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pooled and transported to the laboratory in air tight container (Sattanathan and Venkadalakshmi 2016).

Experimental setup:

Ten plastic tubs of 24 (l) X 43 (b) cm size were used for the present experiments, 12 rohu Fish size (1±0.2gm) transferred to each plastic tubs were filled with 14 litters of chlorine free water and aerated well. All the fishes are feed twice a day between 9am to 10pm and 4pm to 5pmThe group of fishes were exposed with gir fresh cow urine of different concentrationin100%,50%,25%,20%,10%,5%,4%,2%,1%,0.1 %,0.01%,0.001%.A Control group was maintain separately without treatment of cow urine.

Table 1:Treatments:Different concentration of fresh cow urine exposed in the medium.

Treatments	Concentration	Ratio	
		Cow urine	Water
T1	100%	14 (l)	-
T2	50%	7(l)	7(l)
T3	25%	3500(l)	10.500(l)
T4	20%	2.800(ml)	11.200(l)
T5	10%	1.400(ml)	12.600(l)
T6	5%	700(ml)	13.300(l)
T7	4%	560(ml)	13.440(l)
T8	2%	280(ml)	13.720(l)
T9	1%	140(ml)	13.860(l)
T10	0.1%	14(ml)	13986(l)
T11	0.01%	1.4(ml)	13998.6(l)
T12	0.001%	0.14(ml)	13999.86(l)

Growth parameters:

Growth $=$ Final weight – Initial weight (g)

$$\text{Growth Rate} = \frac{\text{Weight gain}}{\text{No of days x Initial weight}} X(\text{mg.day-1})$$

$$\text{Percentage of increase in body weight} = \frac{\text{Final weight – Initial weight}}{\text{Initial weight}} X\ 100\ (\%)$$

$$\text{Average Daily Growth} = \frac{\text{Final body weight – Initial body weight}}{\text{No of feeding days}} (\text{g/day})$$

$$\text{Survival rate} = \frac{\text{Initial number of fish – Mortality}}{\text{Initial number of fish}} X\ 100\ (\%)$$

3.RESULTS:

Survival rate:

The survival rate of was presented in Table (2). The result shows Highest survival rate in Control and lowest survival rate in (T1). The survival of T1 (100% concentration of cow urine) in only 5 minutes, T2 (50%) survival in 5 minutes, T3 (25%) was survived in 8 minutes, T4 (20%) was survived in

12 hours, T5 (10%) was survived in 1 day, T6 (5%) was survived in 36 hours, T7 (4%) was survived in 2 days, T8 (2%) was survived in 4 days, T9 (1%) was survived in 1 week and T10 (0.1%), T11 (0.01%), and T12(0.001%) was survived more than 2 weeks.

Fig.1 Mortality rate of *Labeo rohita* fingerlings
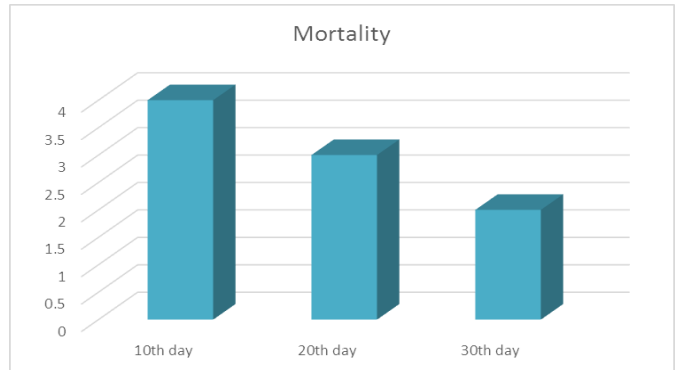
GROWTH PARAMETERS:
10th Day

The growth parameters indices growth, growth rate, average daily growth rate where presented in Table (2). The growth was found higher in (T10) 0.048g which had suspended Cow urine. Least growth of 0.011g was recorded in (T12). Least average daily growth rate of 0.0011(mg/day-1) was also recorded in (T12) and highest average daily growth rate of 0.048 mg was recorded in (T10). Highest percentage increase in body weight of 5.7692%was found in (T10) (Table 3; Fig.2).

20th Day

Growth parameters of 20 days cow urine treated fishes are presented in Table (3). Least weight increment of 0.073g was observed in C and highest weight increment of 0.139g was recorded in (T10). Least average daily growth rate of 0.0036(mg/day-1) was observed in C and highest average daily growth rate of 0.0069 mg was recorded in (T10). Highest percentage increase in body weight of 16.7067% was found in (T10) (Table 4; Fig.2).

30th Day

In Table (5) reveals the influence of various growth parameters like weight of fish growth, growth rate and percentage increase in body weight. Least weight of 0.094g was recorded in control. Highest weight increment of 0.148g was recorded in T10. Highest average daily growth rate of 0.0049 mg was recorded in (T10). Least average daily growth rate of 0.0031mg was recorded in C. Highest percentage increase in body weight of 17.7884% was found in (T10) (Table 5; Fig.2).

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Mortality rate:

The mortality was recorded at 10 days interval.10th day the highest survival rate of 100% recorded in the T10,than the control group having a survival rate of 86%.T12 shows a lesser survival rate of while T11 has 72% survival rate. 20th day the highest survival rate of 100% recorded in the T10, than the control group having a survival rate of 72%. T12

shows a lesser survival rate while T11 has 58% survival rate. 30th day the highest rate of 100% recorded in the T10, than the control group having a survival rate of 56%. T12 shows a lesser survival rate while T11 has 44% survival rate (Table 3,4 & 5).

Table :2 Survival rate of *Labeo rohita* in various concentration

Treatments	Concentration	Survival rate
C		Live
T 1	100%	5(min)
T 2	50%	5(min)
T 3	25%	8(min)
T 4	20%	12 hours
T 5	10%	1 day
T 6	5%	36 hours
T 7	4%	2 day
T 8	2%	4 day
T 9	1%	1 week
T 10	0.1%	Live
T 11	0.01%	Live
T 12	0.001%	Live

Fig. 2 Survival Rate of Labeo rohita in various concentration
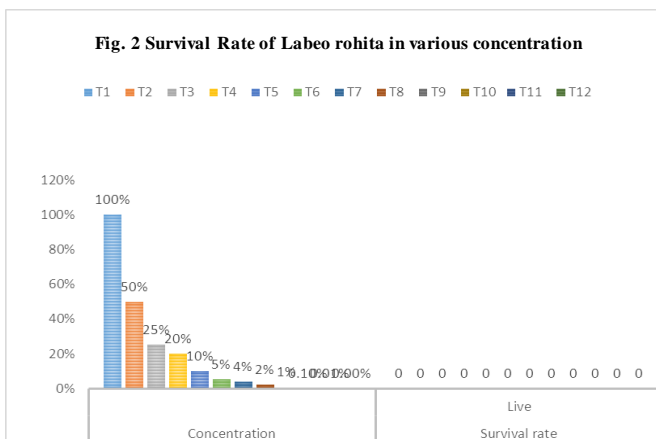
4.DISCUSSION:

The cow urine optimum concentration is capable of promoting growth and food utilization of cultured fishes as in the present experimental model of *labeo rohita* fingerlings. The easy index for assessing the influence of any chemical or biological agent on fish and in aquaculture production is growth. Growth promoters and hormones are used to enhance growth and production (Sambhu and jayaprakash,1997).The knowledge on the influence of any chemical in the environment over growth and food utilization efficiency is essential for aquaculture practices in water (Rao., 2000).

The result of the present study, that the growth of *labeo rohita* fingerlings reared in cow urine added water showed better growth characteristics than the control. It reveals that, the cow urine has a direct relationship with growth and survival of fishes. After 30 days the cow urine is influences of various growth parameters like growth rate, percentage of growth rate, average daily growth rate and survival rate. The highest weight of growth rate in 0.148mg in T1. Then least weight of growth rate 0.094mg in control. Highest percentage of increase weight of 17.7884% was recorded in T1. Which influences of cow urine on growth of *labeo rohita* is significant. The results of present study also reveals that the cow urine enhances survival of *labeo rohita* among the different treatments.

A literature reveals, the present study also conform the potential of fresh of cow urine in promoting fish health, Which was expressed in good survival. The literature record revealed that the Indian breed cow urine has the maximum efficacy in increasing growth rate, feeding rate, Survival rate when compared to exotic breeds. Labeo rohita (Sattanathan and Venkadalakshmi 2015). Hence, Indian breed cow urine in more potent when compared to that of exogenous cow's.

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Table - 3 Growth characteristic of *labeo rohita* fingerlings during 10 days of experimental period.

Parameters	C	T10	T11	T12
Initial weight w1 (g)	0.858± 0.071	0.832 ± 0.073	0. 851± 0.067	0.841 ± 0.083
Final weight w2 (g)	0.871±0.047	0.880 ± 0.068	0 .863 ± 0.048	0.852±0.053
Growth w2-w1 (g)	0.013	0.048	0.012	0.011
Growth rate (g/day)	0.0015	0.0057	0.0014	0.0013
Percentage of increase in body weight (%)	1.5151	5.7692	1.4101	1.3079
Average daily growth rate (Mg/day-1)	0.0013	0.0048	0.0012	0.0011
Survival rate (%)	86	100	86	72

Table – 4 Growth characteristic of *labeo rohita* fingerlings during the 20 days of experimental period.

Parameters	C	T10	T11	T12
Initial weight w1 (g)	0.858± 0.071	0.832 ± 0.073	0. 851± 0.067	0.841 ± 0.083
Final weight w2 (g)	0 .931 ± 0.046	0.971 ± 0.015	0.956 ± 0.032	0.925 ±0.055
Growth w2-w1 (g)	0.073	0.139	0.105	0.084
Growth rate (g/day)	0.0085	0.0167	0.0123	0.0099
Percentage of increase in body weight (%)	8.5081	16.7067	12.3384	9.9881
Average daily growth rate (Mg/day-1)	0.0036	0.0069	0.0052	0.0042
Survival rate (%)	72	100	72	58

Table – 5 Growth characteristic of *labeo rohita* fingerlings during the 30 days of experimental period.

Parameters	C	T10	T11	T12
Initial weight w1 (g)	0.858 ± 0.071	0.832 ± 0.073	0. 851± 0.067	0.841 ± 0.083
Final weight w2 (g)	0 .952± 0.029	0.980 ± 0.005	0.977 ± 0.012	0.957± 0.040
Growth w2-w1 (g)	0.094	0.148	0.126	0.116
Growth rate (g/day)	0.0109	0.0177	0.0148	0.0137
Percentage of increase in body weight (%)	10.9557	17.7884	14.8061	13.7931
Average daily growth rate (mg/day-1)	0.0031	0.0049	0.0042	0.0038
Survival rate (%)	44	100	44	56

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