ISSN: 0976-3031

Available Online at http://www.recentscientific.com

International Journal of Recent Scientific Research
Vol. 7, Issue, 11, pp. 14375-14378, November, 2016

International Journal of Recent Scientific Research

Research Article

GROWTH RESPONSES OF LABEO ROHITA (HAMILTON) FINGERLINGS TREATED WITH DIFFERENT BREEDS OF FRESH COW URINE

Priya G* and Venkatalakshmi S

Department of Zoology, Govt. College for Women (Autonomous), Kumbakonam- 612001

ARTICLE INFO

Article History:

Received 16th August, 2016
Received in revised form 25th September, 2016
Accepted 23rd October, 2016
Published online 28th November, 2016

Key Words:

Cow urine, Indian major carp, Growth parameters, *Labeo rohita*, Gir

ABSTRACT

Fresh water aquaculture in India is mainly based on Indian major carps (*Labeo rohita*, *Catla catla*, *mrigala*) with an annual production of 1.66 million tons. And exotic carps, which together contribute to over 87% of total aquaculture production of 1.93 million tons (FAO 1999).The cattle urine are beneficial to the filter feeding and omnivores fishes. Urine consisting of water (95%), Urea (2.5%), and (2.5%) of minerals, salts, hormones and enzymes which have been scientifically proven as safe medication. So the present investigation growth and survival parameters were carried out in detail about the different breeds of fresh cow urine activity. *Labeo rohita* fingerlings treated with 0.1% concentration of three breeds of cow urine. The growth parameters were analyzed and compared to the control groups. Water quality variables such as salinity, EC, TDS, Turbidity etc., the results of this study prove that cow urine as ecofriendly bio enhancer.

INTRODUCTION

Aquaculture is one of the fast growing food producing sectors of the world and aimed to increase productivity per unit space. Fish forming is considered as on excellent innovation for the use of organic waste. The manuring and supplementary feeding play a vital role in various types of fish farming practices. The feed and fertilizers cost and this could be reduced considerably by integrating fish farming with livestock farming which ultimately economic the cost of production. Since livestock wastes have good value, they have been utilized in fish farming practices in India and South East Asia during the last few decades (Hora and pillay1962).

In fish farming nutrition and fecal is critical because feed represent 40-50% of production cost (Craig and Helfrich, 2002). The general problem of high feed cost associated with fish culture has been addressed by studies on the use of cheaper ingredients as protein sources (De silva *et al*,. 1988). Feed is undoubtedly the single largest operating cost item intensive fish culture which needs a high protein (Cho *et al*., 1985;). Recently cow urine has been reported as bio enhancer of source allopathic antibiotics and anticancer drugs. Cow urine not only enhanced their effect but also reduced the toxic and other adverse effect of their synthetic drugs. As per Ayurveda cow urine is needed to purify and detoxify many drugs. Cow urine distillate known as “Kamadhenu ark” exhibited many biological activities including immune modulatory and anti-potential anti-microbial effect (R.S Chauhan *et al*., 2004). Food utilization characteristics are species dependent and also dependent on size of the fish and its habitat. Currently attention is focused on the low cost and eco-friendly feeding techniques in aquaculture production. The factors include temperature (Vivekanandan and Pandian, 1977) size of fish (Gerald, 1976) hormones (Nirmala and Pandian, 1983; Arul, 1986; Jayaprakash and Sindhu 1994 &Jayaprakas and Sambhu, 1994) and growth promoters (Unnikrishnan, 1995; Sambhu and Jayaprakas, 2001 & Abraham, *et al* 2001) are found influence daily food intake (Ebanasar and kavitha 2003). Development of aquaculture is mainly depends on availability of compatible and suitable diet. Fish is a good source of protein and also has essential amino acids with minerals like Zinc, Magnesium, Sodium, etc (Barlas, 1986). The intensive culture system is the first step towards industrial production methods offering several advantages. The system exclusively feed based and is expected to be main stay for increasing fish production in the years to come. The Indian carps, such as the *rohu (Labeo rohita)*, *mrigal (Cirrhinus mrigala)*, and *catla (Catla catla)* are another group of carp species native to the Indian subcontinent and produced predominantly there. These fish are produced primarily in fertilized ponds with the use of supplemental feed. Santhakumar (1996) recorded the highest fishes production of 5.9 t/ha/yr by using cattle dung as well as urine. Cattle urine

*Corresponding author: **Priya G**
Department of Zoology, Govt. College for Women (Autonomous), Kumbakonam- 612001

was used as the exclusive source of nutrients the fish yield registered was appreciably higher (5.596 t/ ha /yr). Cattle urine befitting source of nutrients for carp production (Athithan *et al, 2001*). Chauhan and Garg (2003) considered cow urine as bio enhancer. As a group, various fresh water fish species that exhibit omnivorous feeding behavior historically have been fed prepared diets containing relatively high levels of soybean meal (up to 60% weight). This group of fish constitutes the largest sector of world aqua cultural production by tonnage and are a major user of soybean products. Soybean recognized for having the most balanced amino acid composition of plant food stuffs, and the relative amounts of indispensable amino acid in these various products are very similar when expressed as a percentage of crude protein (Lim and Akiyama 1992). In India cow urine is used by majority of rural population as folklore remedy in almost all the states. Increased demand for giant fresh water fish *Labeo rohita* as food has stimulated the development of fish culture operation in India. In 'Sustruta samhita' & 'Ashtanga Sangraha' cow urine has been described as the most effective substance secretion of animal origin with innumerable therapeutic values urine of cow contains 24 types of salts and the medicines made from cow urine are capable of curing even the most incurable disease. Cow urine contains 95% water,25% urea and 25% minerals, salts, hormones and enzymes and also it contains iron, calcium, phosphorous,salts,carbonicacid,potash,nitrogen,ammonia,manganese,sulphor,phosphate, potassium, urea, uric acid, amino acid, enzyme, cytokines, lactose etc.,(Chauhan R.S, 2007). Present study planned to investigate effect of different breeds of fresh cow urine on growth responses of *Labeo rohita*.

METHODS AND MATERIALS

Experimental Fish

Fingerlings of *Labeo rohita* (Hamilton) were procured from S.M. Fish farm, Swamimalai, Thanjavur District and were brought to the laboratory in polythene bags filled with oxygen. The polythene bags were kept floated for 30 minutes in the cement tank for acclimatization of the fingerlings before being released into the tank. Glass aquaria were washed to avoid fungal contamination and then sundried. Healthy fishes were then transferred to plastics tub (Vol 20 ltr) containing decholrinated tap water. Fish of both sexes weighing 1.0±0.2g were used in the present study. They were regularly fed with formulated food and the medium (Tap water) was changed daily to remove feaces and food remnants.

Collection of Cow Urine

Six disease free cows of Gir, Haryana and Frecien were selected for urine collection. The early morning (4.00am) first urine was collected from Goshala, Sri Vittal Rukminni Samsthan, Govindhapuram near Kumbakonam. The urine was pooled and transported to laboratory in airtight sterile containers (Suthanthirakannan .R and Rameshkumar. K., 2014).

Experimental setup

After two weeks of acclimatization three groups of fish were treated, each with different breeds of fresh cow urine at 0.1% concentration in the medium. A control group was maintained separately without cow urine treatment.

Growth Parametes

The experiments were continued for 30 days. Live weights of the experimental fishes were also recorded on 10th, 20thand 30th days. Based on this data the growth parameters like Growth, Growth rate, Specific growth rate, Percentage of increase in body weight were calculated. The growth parameters were calculated by using the following formulae (Petursewiez and Macfutyen., 1970)

Water Quality

Water samples were tested in our laboratory for analyze the water quality parameters such as pH, Temperature, Salinity, Turbidity, TDS, Electrical Conductivity and Dissolved Oxygen. The above parameters were analyzed by using SYSTRONICS 371 model water quality analyser portable kit.

Statistical Analysis: The data were entered in MS Excel and SPSS 20 for graphical representation and further analysis of statistical tests like, Mean standard Deviation and Standard Error Bar graph, Pearson correlation for Growth rate with water quality parameters and Dunnett t-tests treat one group as a control, and compared all other groups (Three breeds) against it.

RESULT AND DISCUSSION

Fig. 1. Effect of fresh cow urine on the growth rate of *Labeo rohita* during the experiment 10th 20th and 30th days linear line represent growth response

Table 1 Effect of fresh cow urine on the growth parameter of *Labeo rohita* during the experiment on 10th day.

Treatment	day10			
	Control	T1	T2	T3
Weight Mean± Stdv	0.79±0.09	0.97±0.06	0.83±0.08	0.78±0.10
Length Mean± Stdv	4.52±0.32	5.21±0.26	4.77±0.25	4.51±0.25
Growth	0.16	0.28	0.15	0.13
Growth rate	0.05	0.07	0.06	0.05
Percentage of increase body weight	24.90	41.46	22.48	19.95
AVRG growth rate/day	0.02	0.03	0.02	0.01

Table 2 Effect of fresh cow urine on the growth parameter of *Labeo rohita* during the experiment on 20th day.

Treatment	20th day			
	Control	T1	T2	T3
Weight Mean± StdDV	0.85±0.17	1.17±0.28	0.93±0.06	0.86±0.10
Length	4.55±0.27	5.32±0.25	5.08±0.35	4.86±0.27
Growth	0.22	0.49	0.25	0.21
Growth rate	0.03	0.04	0.03	0.03
% of growth rate increased	33.99	71.34	37.10	32.05
AVRG growth rate/day	0.01	0.02	0.01	0.01

Table 3 Effect of fresh cow urine on the growth parameter of *Labeo rohita* during the experiment on 30th day.

Treatment	30th day			
	Control	T1	T2	T3
Weight Mean± Std Devition	0.84±0.10	1.18±0.09	1.07±0.11	0.97±0.09
Length	4.61±0.28	5.63±0.28	5.38±0.25	5.22±0.17
Growth	0.21	0.50	0.39	0.32
Growth rate	0.02	0.03	0.02	0.02
% of growth rate increased	33.47	72.93	57.86	49.03
AVRG growth rate/day	0.01	0.02	0.01	0.01

Table 4 Statistical analysis of Mean ± SEM and Significance difference of multiple comparison of using Dunnett t-test for Growth difference in assays with different breeds compare with Control.

Treatment	Control	T1	Sig	T2	Sig	T3	Sig
Initial	0.63±0.03	0.68±0.02	0.31	0.68±0.02	0.40	0.65±0.02	0.95
10th day	0.79±0.03	0.97±0.02**	0.00	0.83±0.02	0.50	0.78±0.03	0.96
20th day	0.85±0.05	1.17±0.08**	0.00	0.93±0.02	0.52	0.86±0.03	1.00
30th day	0.84±0.03	1.18±0.03**	0.00	1.07±0.03**	0.00	0.97±0.03*	0.01

*. The mean difference is significant at the 0.05 level.
a. Dunnett t-tests treat one group as a control, and compare all other groups against it.

Table 5 Pearson Correlation tested for Growth rate of *labeo rohita* compared with water quality parameters during experiment assay day.

Parameter	Growth	Temp	pH	Salinity	EC	TDS	Turbidity	DO	Chlorinity
Temp	0.757**								
pH	0.41	0.37							
Salinity	-0.40	-0.31	0.07						
EC	0.33	0.43	0.42	0.657*					
TDS	0.682**	0.828**	0.33	0.01	0.644*				
Turbidity	0.658*	0.611*	0.48	0.14	0.603*	0.537*			
DO	0.506*	0.710**	0.35	-0.29	0.27	.809**	0.14		
Chlorinity	0.30	-0.07	0.18	-0.36	-0.29	-0.25	0.05	-0.29	

This study reveals the result of growth performance of *labeo rohita* in different breeds of fresh cow urine. *L. rohita* growth was gradually increased 10th day to end date of 30th day. Amongst three assays day 30th day obtains highest weight was recorded Mean± SDV in T1 (18±0.09), as such as the length is (5.63±0.28) highest in the same, comparatively it is greater than the other groups. In the table 3 shows the growth of fish (T1)0.50,(T2) 0.39 and (T3)0.32 in three different breeds in which T1 shows maximum growth of *L. rohita* as like the growth rate also 0.03 is higher than rest of two breeds and control growth rate as 0.02. Percentage of growth rate increased in T1 (72.93%) enhanced than other breeds of T2(57.86%) and T3 (49.03). Average growth rate was calculated per day the result found 0.0.2 was highest in Gir breeds (T1) better of the three breeds in experimented test in 30th day.

There were three different breeds compared with control in three classified interval days of 10th, 20th and 30th. Dunnett t-test were used for multiple comparison all parameters in one analysis. A result of comparative analysis showed that T1 significant difference from the all the assays of 10th *(P*<0.01, 0.97±0.02), 20th (*p*<0.01,1.18±0.03) and 30th (*P* <0.01,1.18±0.03) day experiments.

The present study primly aim to test how consistently *(L.rohita)*fish growth response to the three different breeds fresh cow urine. Although the water playing important role in aquatic life. In this case we tested water quality parameter also correlated with fish growth rate. To obtain good growth in fishes under intensive culture conditions, the water quality parameters such as Temperature, pH, Salinity, EC, TDS, Turbidity, DO and Chlorinity. Table (5) explain the result of fish growth positive correlate with four parameters Temperature, Turbidity, TDS and DO. Rest of four parameters are not related to growth of fish in which Salinity are negatively correlate to the growth. Kausar and Salim (2006) experimented and proved that the L.rohita growth can generally function in a wide rane, as well as lower and upper lethal temperature, for various activities.

There were many Studies experimented growth efficiency of carp species in fish culture like different feeding regimes, algal diet, water quality influence, hormonal activity and phytase supplementation. The present study result statistically significant difference observed in growth performance was in using fresh cow urine of Indian breed (Gir). This indicates Gir cow urine was optimum for enhancing the bio availability of nutrient for *L.rohita* fingerlings. Athithan *et.al*., (2001) described in their study cow urine was used as the exclusive source of nutrients for the fish yield also that can effect target production of the fresh water carps in composite fish culture. There were neglected study in this field for using cow urine with growth response in fresh water fishes and its needs longer and intensive study for in this field.

CONCLUSION

In our study revealed the result of water additive route of Indian breed (Gir) fresh cow urine improved growth performance in fingerlings of Indian major carp of (*L. rohita*). Cow urine could be used as cheaper, natural and ecofriendly bio enhancer and could be used as an alternative to chemical growth promoters. We concluded that *L. rohita* growth performance will useful to larger fresh water fish farms also.

Reference

Abraham, S., T.J. Ramesha, B.Ganadhara and T.J. Varghese. 2001. Growth responses of common carp Cyprinus carpio (Linn) to varied levels of livol a non hormonal growth promoter. *Indian. J. Fish*. 48(4): 397-401.

Arul. V, 1986. Effect of ethylsternol on the growth and food utilization in Channa striatus Proc. Indian Acad. Sci. (Animal Science) 95 (1): 51-57.

Athithan S. T.Franccis, N. Ramanathan and V. Ramadhas. 2001. Cattle urine as a benefitting source of nutrients for carp production. *Indian journal of fish*. 48(2): 231-235.

Barlas, A, 1986. Post –harvesting technology for fish. Progressive fram., 6:59-65.

Chauhan RS, Garg N. 2003.Cow Therapy as an Alternative to Antibiotic.

Banglore, Karnataka: Indian Science Congress

Chauhan R.S. Singh D.D. Singhal, L.K. and Kumar R. 2004. Effect of cow urine on the interlukin-1 and 2. Journal of immunology and immunopathology, 3:74-77.

Chauhan R.S, 2007, Immunomodulation using cowpathy. J.Immunol. Immunopathol., 8:75-80.

Cho C.Y, Cowey C.B. and Watanabe T, 1985. Metholdological approaches to research and development. International Development Research Center, Otawa, Canada.

Craig, S and I.A. Helfrich, 2002, Understanding fish nutrition, feeds and feeding. Department of Fisheries and Wildlife Science, Virginia tech., 420(256).

De silva, S.S., C.N. Keembiyahetty and R.M. Gunasekara, 1988, Plant ingredient substitutes in *Orechromis niloticus* (L) diets: Ingredient digestibility and effect of dietary protein content on digestability. J. Aquaticulture in the Tropics., 3: 127-138.

Ebanasar. J and S. Kavitha, 2003. Effect of Short term exposure of probiotic lactic acid bacteria on the respiratory and excretory physiology of labio rohita. Symposium on physiological approaches to conserve biodiversity and to tackle environmental health hazards. Indian Society for co mparative animal phusiology. Tirupathi.

FAO, 1999. Aquaculture production sttistics1998-1997. FAO Fisheries circular No.815, Rev.11FAO Rome:203

Gerald V.M. 1976. Effect of size of fish on the consumption absorption and conversion of food in *Ophiophalus punctatus* (Blotch.) Hydrobiologia. 49(1):77-85.

Hora, S.L. and T.V.R. pillay. 1962. Hand book on fish culturein the Indo Pacific region. Fish. Biol. Tech. Pap. 14: 204pp.

Jayaprakas V and C. Sambhu, 1994. Effect of dietary hormone on feed utilization, growth and body composition of the pearlspot, Etroplus suratensis (Bloch) in a brakishwater pond. Indian J. Mar. Sci., 24; 32-36.

Jayaprakash V and B.S. Sindhu, 1994. Effect of hormones on feed utilization of the Indian major carp cirrinus mirgala. Fishery technology. 33 (1); 21-27.

Kausar, R and M. Salim, 2006. Effect of water temperature on the growth performance and feed conversion ratio of *Labio rohita*

Lim,C.and Akiyama, D. M 1992. Full-fat soybean meal utilization by fish. Asian Fish, Sci.5.181-197

Nirmala A.R.C and T.J. Pandian, 1983. Effect of steroid injection on food utilization in Channa striatus. Proc. Indian Acad.Sci. (Animal Science). 92:1-10.

Petursewiez K and Macfutyen., 1970. Productivity of terrestrial animals. IBS Hand Book B. Oxford Backwell.

Sambhu C. and V.Jayaprakas (2001). Livol (IHF-1000) a new herbal growth promoter in white prawn, *Penaus indicus* (crustacean). *Ind. J. Mar. Sci.* **30**: 38-43.

Santhakumar, R. 1996. A comparative study on fish production in fish-livestock integrated and non-integrated system. Ph.D., thesis, 150pp. Tamilnadu Veterinary And Animal Science University, Chennai.

Suthanthirakannan. R and Rameshkumar. K., 2014. Quantitative Analysis of Biochemicals and Hormones In Bovine Saliva (*Bos Indicus*) with Reference to Estrus Detection. The Scitech Journal. Vol 01 (04) : 26-29.

Unnikrishnan G, 1995. Effect of live on growth food utilization and body composition of the Indian major carp Catla catla (Ham) M.Sc., Dissertation University of Kerala. Pp 34.

Vivekanandan E and T.J. Pandian, 1977. Surfacing activity and food utilization in a tropical air-breathing fish exposed to different temperature. Hydrologia. 54(2):145-160.

****

How to cite this article:

Priya G and Venkatalakshmi S.2016, Growth Responses of Labeo Rohita (Hamilton) Fingerlings Treated With Different Breeds of Fresh Cow Urine. *Int J Recent Sci Res.* 7(11), pp. 14375-14378.