

**RESEARCH ARTICLE**

## **Biochemical Responses of the Fish *Cirrhinus mrigala* Exposed to Urine of Different Cow Breeds**

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### **ABSTRACT:**

Gomutra has been recorded for its high prophylactic and therapeutic values since Vedic times in India. Its application in Aquaculture has not been explored so far. Hence the present study has been aimed to assess the effect of different breeds of cow urine on the growth and biochemical parameters of *Cirrhinus mrigala* fingerlings. Urine from different breeds of cow like Haryana, Gir, Jersey was collected. Fingerlings were treated with 0.1% concentrations of different breeds of cow urine for a period of seven days. The control and treated groups were sacrificed on the 30<sup>th</sup> day post cow urine treatment and the growth and biochemical parameters were analysed, the results show significant effect of cow urine on the nutrient value of the Indian major carp *Cirrhinus mrigala*.

**KEYWORDS:** Gomutra, Vedic times, Cow urine, *Cirrhinus mrigala*, biochemical parameters.

### **1. INTRODUCTION:**

Sustainable aquaculture depends upon eco-friendly economically and socially viable culture systems. Organic load is a common problem in aquaculture ecosystem. The recycling of organic wastes for fish culture serves the dual purpose of cleaning the environment and providing economic benefits. The recycling of animal dung/wastes in fish ponds for natural fish production is important in integrated farming and to reduce expenditure on costly feeds and fertilizers which form more than 50% of the total input cost (Dhawan and Kaur 2002).

Though pond fertilization with organic and inorganic fertilizers is a very cheap and effective method of increasing productivity, their excessive use deteriorates the water quality (Boyd 1992, Garg and Bhatnagar 1996) and depletes the dissolved oxygen to detrimental level (Singh et al 2004). Organic manuring is widely practiced in carp culture systems to ensure sustained supply of essential nutrients for augmenting natural pond productivity to obtain increased fish production at cheaper rates (Singh and Sharma 1999). In integrated farming technology animal manures particularly farmyard manure, poultry dropping, cow dung, biogas slurry ect., are suitable as substitutes for costly feed and fertilizers (Schroeder 1980; Dhawan and Toor 1989). It has been proved that growth rate depends on the type of manure used (Geen et.al., 1989).

Because manure collected from different animals differ in quality.

However, cow urine has not been examined for their effect on growth promotion in aquaculture. Literature shows that cow urine has enormous enhancing properties on biological systems. Cow urine one of the ingredients in panchagavya is believed to have therapeutic value. In India cow urine is used by majority of rural population as Folklore remedy in almost all the states. Urine therapy was not only used in India, but for several Centuries in many parts of the Globe. As per Ayurvedic literatures, gomutra is useful in number of diseases particularly in gulma, kusta, ascitis, filaria, aburda (cancer), etc. Cow urine is also used along with herbs to treat various diseases like fever, epilepsy, anemia, abdominal pain, constipation, ect by the traditional healers (Pathak, and Kumar, 2003 Krishnamurthi, Dutta, Devi and Chakrabarti, 2004) Immunomodulatory effect of cow urine were established scientifically (Chauhan, Singh and Singhal, 2001). Very recently, panchagavya has been suggested as a remedy for chikengunya (www.daijiworld.com). Cow's urine has been used in the preparations of soap, nasal powder, body powder, body cream, incense sticks, tooth powder ect. Have been prepared from the cow dung and recommended for medical use (www.hkrl.com/cowurine.html). Probably to add sanctity to the entire gamut of these 'medications', it has been claimed that Indian pure breed cows have 'immunology power' from 90% to 98% while the cow of mixed breed

have less than 40% ([www.goshala.com/articles/panchagavya.php](http://www.goshala.com/articles/panchagavya.php)).

Hence the present study has been planned to study the effect of different breeds of cow urine on growth rate and other biochemical parameters.

## MATERIALS AND METHODS:

### ACCLIMATIZATION:

Fingerlings of mrigal (*Cirrhinus mrigala*) 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 14L capacity for two weeks. Fishes were fed with a pelleted diet of 35% protein content. Excess of feed was removed and regular aeration and water filtration was provided to keep the experimental tubs clean and the experimental fishes healthy.

### EXPERIMENTAL SETUP:

Four plastic tubs of 24(l) X 43(b) cm size were used for the present experiments, ten mrigal fingerlings size  $1 \pm 0.2$  gm were transferred to each plastic tubs were filled with 14 liters of chlorine free tap water and aerated well. Seven healthy fingerlings of mrigal is uniform size were selected and transferred to each glass tanks.

After two weeks of acclimatization fish were treated with different urine of different cow breeds at 0.1% concentration. A control group was maintained separately without urine treatment. Cow urine was collected from healthy cows of different breeds like Haryana, Gir and Jersey free from any infection maintained under medical supervision at Goshala in Sri vital-rukmini Samasthan, Govindhapuram. Cow urine was collected in sterile bottles and was transported immediately to the laboratory.

All The fish were fed with formulated feed prepared in the laboratory. Feed every day between 2pm to 4pm. The unfed and fecal matter were collected and dried in a hot air oven at 60°C and weighed.

### GROWTH PARAMETES:

The experiments were continued for 30 days. Live weights of the experimental fishes were also recorded on 10<sup>th</sup>, 20<sup>th</sup> and 30<sup>th</sup> days. Based on this data the growth parameters like Growth, Growth rate, Specific growth rate, % of increase in body weight were calculated.

### BIOCHEMICAL STUDIES:

Samples were taken for biochemical studies from a similar set of experiments conducted separately. The proximate biochemical compositions were assayed on sample from 30<sup>th</sup> day experimental and control fishes. The protein was estimated by Lowry's method (Lowry et al, 1951), carbohydrate by (Anthrone method) and Lipid by (phosphor-vanilline method) in the muscle and liver sample of the experimental and control fishes.

## RESULT AND DISCUSSION:

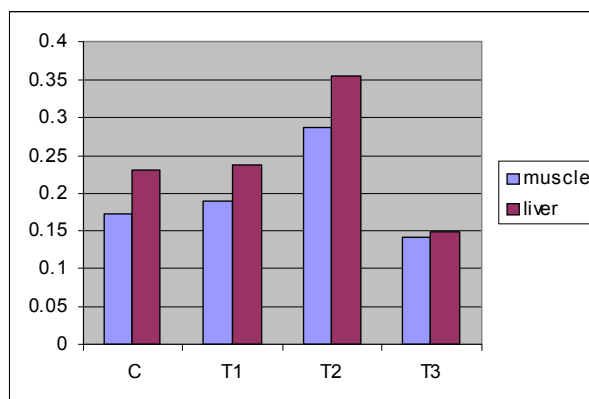
Nutrients in the water are indispensable for the growth and production of fauna and flora inhabiting in the aquatic habitat. The continuous use of nutrients in water leads to depletion of nutrients in water. Hence nutrients are added to aquatic ecosystems. This will support the plankton population and other fish feed organisms. Manuring has many effects on the aquatic organisms. Sing and Sharma(1999) reported that manuring promote the growth of L.rohita in addition to the different effects it had in the environment. Similar results were recorded in the growth and production of prawn (Sarkar et.al 1998).

The result of the present study also reveals that the growth off the C.mrigala reared in cow urine manured water showed better growth characteristics than the control. It reveals that the cow urine manuring has a direct relationship with growth and production of fishes. After 30 days the cow urine is influence of various growth parameters like fish growth, growth rate and % increase in body weight. Least weight augmentation of 0.218g was recorded I control. Highest weight increment of 0.427g was recorded in T2. Highest % increase in body weight of 30.61% was found in T2. The final weight of *C.mrigala* reared in different treatment showed table. Which indicates that the influence of cow urine on growth of *C.mrigala* is significant. The cow urine manuring process also increased the protein level in muscle. This reveals that the manuring process is beneficial for the growth as well as physiological process of the fish and its nutritive value.

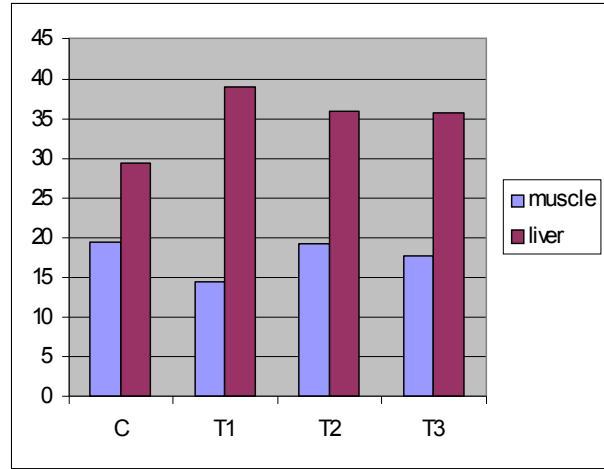
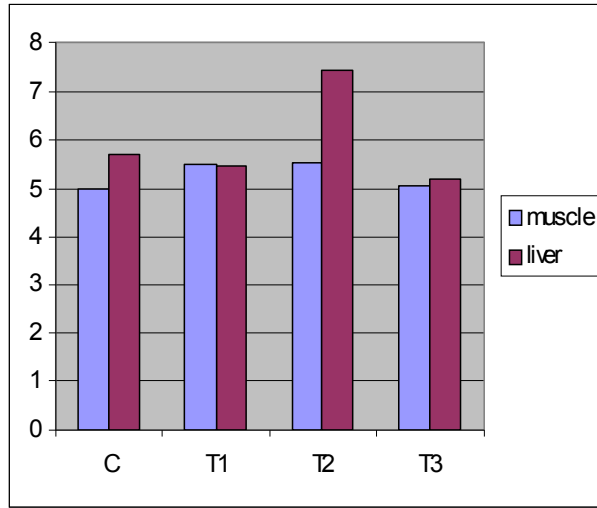
Organic menuring is widely practiced in carp culture systems to ensure sustained supply of essential nutrients for augmenting natural pond productivity to obtain increased fish production at cheaper rates (Sing and Sharma 1999). The result of the present study also reveals that the cow urine enhances survival of *C.mrigala* among the different treatments and the results reveals the application of cow urine is more beneficial to get more survival, to get more growth rate and environmental safety.

Hence the present study is recommended that the application of cow urine is better way of safe application in the field condition.

### CHORBOHYDRATE



**PROTEIN**



**GROWTH PARAMETERS:**

Growth characteristics of mrigal fingerlings during the 10 days of the experimental period.

**LIPID**

PARAMETERS	C	T1	T2	T3
Initial weight w1 (g)	1.033 ± 0.149	0.966 ± 0.1490	1.016 ± 0.134	0.966 ± 0.124
Final weight w2 (g)	1.135 ± 0.149	1.103 ± 0.172	1.166 ± 0.1490	1.051 ± 0.1238
Growth w2-w1 (g)	0.102	0.137	0.150	0.085
Growth rate (g/day)	0.0098	0.0141	0.0142	0.0087
Percentage of increase in body weight (%)	9.87	14.18	14.76	8.00
Specific growth rate (%)	0.94	1.32	1.37	0.84

**Growth characteristics of mrigal fingerlings during the 20 days of the experimental period.**

PARAMETERS	C	T1	T2	T3
Initial weight w1 (g)	1.135 ± 0.149	1.103 ± 0.172	1.166 ± 0.1490	1.051 ± 0.1238
Final weight w2 (g)	1.277 ± 0.141	1.303 ± 0.172	1.395 ± 0.143	1.197 ± 0.105
Growth w2-w1 (g)	0.142	0.200	0.229	0.146
Growth rate (g/day)	0.0125	0.0181	0.0196	0.0135
Percentage of increase in body weight (%)	12.51	17.15	19.63	13.89
Specific growth rate (%)	1.17	1.66	1.79	1.30

**Growth characteristics of mrigal fingerlings during the 30 days of the experimental period.**

PARAMETERS	C	T1	T2	T3
Initial weight w1 (g)	1.277 ± 0.141	1.303 ± 0.172	1.395 ± 0.143	1.197 ± 0.105
Final weight w2 (g)	1.495 ± 0.135	1.668 ± 0.132	1.822 ± 0.147	1.433 ± 0.082
Growth w2-w1 (g)	0.218	0.365	0.427	0.236
Growth rate (g/day)	0.017	0.028	0.031	0.020
Percentage of increase in body weight (%)	17.07	28.01	30.61	19.72
Specific growth rate (%)	1.57	2.47	2.67	1.79

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