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COMPARATIVE STUDY ON THE EFFECT OF INDIAN AND GROSS BRED COW URINE DISTILLATE ON THE GROWTH & FOOD UTILIZATION PARAMETER OF *CIRRHINUS MRIGALA*

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Abstract

Cow urine is well known for its medicinal properties. The present investigation were undertaken to study of the efficacy of cow urine distillate on growth, food utilization parameters and survival rate of *cirrhinus mrigala.* The cow urine has been recorded for its high prophylactic and therapeutic values since vedic times in India. Hence the present study has been aimed to assess the effect of cow urine different breeds of cow like Gir, Holstein Frecien and Haryana. The fingerlings were tested with Go-Ark of different breeds by mixing directly in the medium at 0.1% concentration . The results showed that Indian CUD have significant effect on the growth performance and food utilization of the fingerlings of India major carp *C. mrigala*.

Key words: CUD, Different breeds of Gomutra, Food utilization, growth parameters, *C.mrigala*

Introduction

Aquatic resources are of vital importance for human welfare as they are important sources of fish used as food (Arunachalam, *et al*., 1980). Due to increase in population all over the world, it is necessary to use all the natural resources judiciously for sustainable development and maximizing the food production. The fresh water field fish, *Cirrhinus mrigala* is an important human food source in parts of South India (Apte and Bhalchandra., 2002). Carps are the mainstay of Indian freshwater aquaculture. Fish is one of the most important components of Asian diets and several reports have exemplified the importance of fish in reducing the risk of cardiovascular diseases. The growth of biomass of fish under intensive culture depends upon various factors notably on environmental factor.

Cows were regarded as wealth and were the backbone of the economy of ancient Indians. Cattle were one of the most frequently used animals described in Vedas. Voluminous treatises are also available on cows, e.g., *Gau Ayurveda*'. Cow urine is elaborately described in ancient Ayurvedic scriptures such as Charaka Samhita, Shushruta Samhita, and Brahad-Wagbhatt as bitter, pungent, spicy and warm. Cow urine, used as an insecticide or as a regulator for various disorders like gas, acidity, and cough, promotes the power of wisdom in human beings, acts like a universal medicine and is easily digested by all (Apte and Bhalchandra., 2002). Diseases in human beings and animals are due to shortage or accumulation of certain elements in the body. Cow urine contains all such elements. Cow urine was reported to cause weight loss and to cure leprosy, cardiac and kidney problems, indigestion, stomach ache, edema, *etc* (Kekuda, *et al.*, 2007).

Cow urine contents are 95% water, 2.5% urea and 2.5% minerals, salts, hormones, and enzymes. It contains iron, calcium, phosphorus, carbonic acid, potash, nitrogen, ammonia, manganese, sulphur, phosphates, potassium, urea, uric acid, amino acids, enzymes, cytokine, lactose etc. Cow's urine was found to contain various inorganic, including silver, traces of gold, Sodium and Potassium in ratio of 4:1 (36%: 9% in dried urine), apart from about 3% urea. Further important findings were, that fresh cow-urine contains 50-100 mg oestrogens/100 ml; 20-200 μg of cortico-steroids/100 ml and 0.05-0.15 mg of 17- keto-steroids/100 ml (Chauhan *et al.*, 2004).

Experimental Fish

Fingerlings of *Cirrhinus mrigala* (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 glass aquaria (Vol 20 lt) 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 faeces and food remnants.

Collection of Cow Urine

Six disease free cows of Gir, Haryana and Holstein 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).

Cow Urine Distillate

Cow urine was distilled at 100°C for 2 hrs using glass distillation apparatus (Kekuda, *et al.*, 2007). The cow urine distillate (Go-Ark) was used in the same day for treatment without storage.

Experimental setup

After two weeks of acclimatization three groups of fish were treated, each with different breeds cow urine distillate Gir CUD-T1, Haryana CUD-T2, Frecien CUD-T3 at 0.1% concentration by mixing in the tank medium. A control group was maintained separately without cow urine treatment (Padmapriya and Venkatalakshmi., 2014).

Morphological growth analysis

For length and weight the fishes were measured individually at the interval of 10 days. The fishes were weighted by digital electronic balance. Ruler was used to measure the total length from head and tip of caudal fin. The fingerlings were released in water immediately after body measurements. Each of the growth treatment was fed with formulated feed of 2% total body weight (Venkatalakshmi., 2006). The experimental fish were fed twice a day for an hour between 9.00am to 10.00am and 4.00pm to 5.00pm. The unfed was collected and dried (60º C) in a hot air oven and weighed. The faeces were also collected separately, dried and weighed.

Food utilization parameters

The growth and food utilization parameters were calculated by using the following formulae (Petursewiez and Macfutyen., 1970)

$$\text{Growth} = \text{Final weight} - \text{Initial weight (mg)}$$

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

$$\text{Percentage of Increase in Body weight} = \frac{\text{Final weight} - \text{Initial weight}}{\text{Initial weight}} \times 100$$

$$\text{Average Daily Growth} = \frac{\text{Final body weight} - \text{Initial body weight}}{} \text{ (gm/day)}$$

No of feeding days

Food utilization parameters were calculated as follows:

$$\text{Feeding rate} = \frac{\text{Total dry food consumed}}{\text{No of days x initial live wt. of fish}} \text{ (mg. g body wt. -1 day -1)}$$

Food absorbed = Food consumed – faeces produced (mg. g. body wt.-1 day -1)

$$\text{Absorption rate} = \frac{\text{Total food absorbed (dry)}}{\text{No of days x initial live wt. of fish}}$$

$$\text{Absorption efficiency} = \frac{\text{Food absorbed}}{\text{Food consumed}} \text{X } 100$$

$$\text{Gross Conversion efficiency (K1)} = \frac{\text{Growth rate}}{\text{Feeding rate}} \text{ X } 100$$

$$\text{Net Conversion efficiency (K2)} = \frac{\text{Growth rate}}{\text{Absorption rate}} \text{ X } 100$$

Survival rate is calculated by following formulae:

$$\text{Survival rate} = \frac{\text{Initial number of fish – mortality}}{\text{Initial number of fish}} \text{ X } 100$$

Statistical analysis

The test of significance was done manually with student's-t test assuming unequal variance in MS-Excel.

Results

Growth performance

The growth response of *C. mrigala* in terms of increase in body weight, growth rate, specific growth rate (SGR) are presented in Table 1. The experiments revealed that on the 30th day, the highest growth rate was recorded in T3. The maximum growth enhancement was

recorded in Gir breed CUD with a growth rate of 0.0044mg/day, when compared with 0.0032 mg/day of control.

Food utilization parameters

The effect of CUD in *Cirrhinus mrigala* fingerlings on food utilization parameters of Feeding rate, food absorbed, absorption rate, absorption efficiency, Gross conversion efficiency and Net conversion efficiency were showed in table 2. The food utilization parameters were significantly higher in experimental fishes treated with CUD, when compared to the controls. It was noted that highest feeding rate of Haryana CUD was observed in T2 (0.0224 mg/day) which is higher when compared with control which feeding rate is 0.0040 mg/day, (Table 2).

Survival Rate

The mortality was recorded at 10 days interval. The highest survival rate of 75% was recorded in the T1, which is significantly higher than the untreated control group having a survival rate of 41.5%.

Discussion:

These findings have practical importance in maximizing the growth and survival of fingerlings by 0.1% treatment. The present study demonstrated that the cow urine distillate is requirement of *c. mrigala* fingerlings for best growth performance was 0.1% concentration treatment. The chemicals, adversely affect aquatic fauna. In spite of this, chemicals and hormones are also used as growth promoters to increase food utilization in fishes and to achieve high growth and production in fishes. (Arunachalam *et al*., 1980 and Ramaneswari and Rao., 2000). Different authors reported the suitability of food components of both plant and animal origin for their ability to contribute better growth performance in cultured stocks (Sambu and Jayaprakash., 2001).

Cow dung is found to be an effective source of organic fertilization, which positively influences the growth performance of major carps of fish production (Sughra *et al*., 2003; Kanwal *et al*., 2003, Jayalakshmi., 2006). Pond fertilization is a management protocol to enhance biological productivity using both organic manure and inorganic chemical fertilizers. Evaluation of fertilizer value of different organic manure (pig, cow, chicken and green manure) has been a subject of research in aquaculture (Green, 1990; Morissens *et al*., 1996; Yaro *et al*., 2005)..

Kirchmann and Petterson (1994) found that stored human urine had pH value of 8.9 and composed of cations like Na, K, NH4, Ca and anions like, Cl, SO4, PO4 and HCO3. Nitrogen

was present as ammoniacal form with ammonium bicarbonate being the dominant compound. Urea and urates decomposed during the storage. Heavy metal concentrations were low but, copper, mercury, nickel and zinc were 10-500 times higher than in precipitation and surface waters.

Recently cow urine distillate has been granted U.S. Patents (No. 6896907 and 6,410,059) for its medicinal properties, particularly for its bioenhancer activities of commonly used antibiotics, anti-fungal and anti-cancer drugs. The activity of Rifampicin, a front-line anti-tubercular drug used against tuberculosis, increases by about 5-7 folds against *E. coli* and 3-11 folds against Gram-positive bacteria. Potency of 'Taxol' (paclitaxel) has been observed to get increase against MCF-7, a human breast cancer cell line in *in-vitro* assays (The Hindu, 4 July, 2002; The Indian Express, 4 July, 2002).

Kumar *et al.* (2004) evaluated the blastogenic activity of lymphocytes and effect of *in-vivo* cow urine treatment on blastogenesis, so as to find out their potential to mount protective immune response against diseases in chicks. The increase in lymphocyte proliferation activity was maximum during first two weeks of development. During developmental period cow urine enhanced the T- and B- cell blastogenesis by 1.81% and 2.21%, respectively. Similarly, Chauhan and Singh (2001) reported that cow urine significantly enhances T- and B- cell proliferative activity in mice. This might be the reason for the increased survival rate in CUD treated fish.

Cow urine is well known for medicinal properties. The investigations were undertaken to study of the efficiency of cow urine distillate in growth food utilization parameters and survival rate. The cow urine has been recorded for its high prophylactic and therapeutic values since vedic time in India. The urine of Gir breed of cows has not been studied so for its application in aquaculture. The effect of (Go-Ark) distilled Hariyana, Gir, Frecien cow urine studying cirrhinus mrigala for water quality and biochemical analysis growth paramerrs.

Table 1: Effect of Gir Go-Ark on the Growth parameters of *Cirrhinus mrigala* fingerlings.

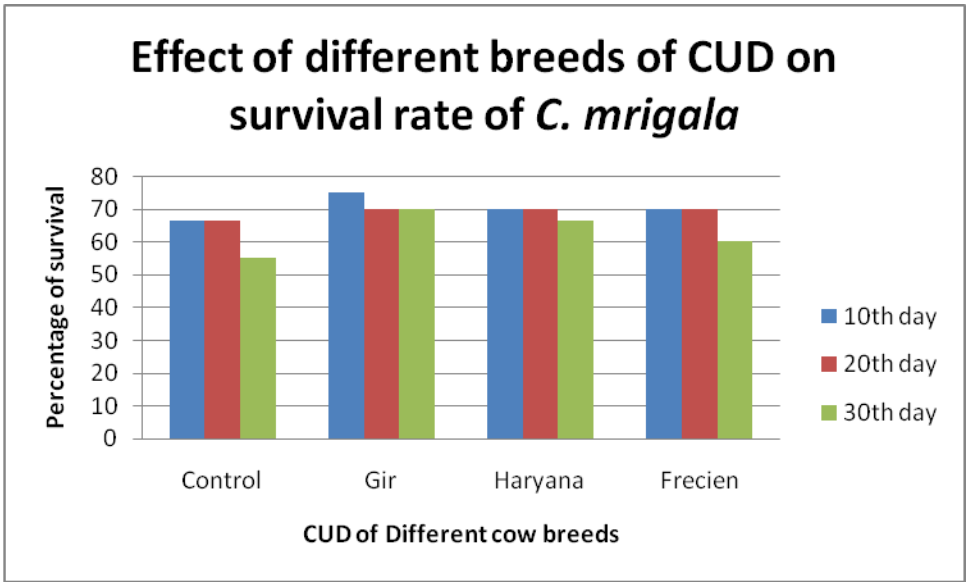
Parameters	Control	T1	T2	T3
Initial Weight W1(g)	0.5175±0.061	0.5275±0.060472	0.5275±0.0664	0.5266 ±0.0666
Final Weight W2	0.5583±0.02483	0.6050±0.04745	0.06083±0.0449	0.6122±0.0486

(g)				
Initial Length (cm)	4.35±0.2345	4.23±0.315	4.175±0.2815	4.07±0.1488
Final Length (cm)	5.03±0.3055	5.2±0.3182	5.133±0.2516	-------
Growth W1-W2 (g)	0.0625	0.0442	0.0825	0.0854
Growth rate (mg/day)	0.0032	0.0024	0.0039	0.0044
Average Daily Growth	0.0062	0.0044	0.0082	0.0085
Percentage of increase in body weight (%)	11.8866	7.8819	15.6903	16.2172
Survival rate (%)	41.6	66.6	66.6	60
Mortality (%)	58.4	33.4	33.4	40

Table 2: Effect off Gir Go-Ark on the food utilization parameters of *Cirrhinus mrigala* fingerlings.

Parameters	Control	T1	T2	T3
Feeding rate (mg/day)	0.0040	0.0150	0.0224	0.0183
Food absorbed (mg/day)	0.2355	0.4224	0.4064	0.4121
Absorption rate (mg/day)	0.0015	0.0020	0.0026	0.0021
Absorption efficiency (mg/day)	13.95	142.60	97.203	109.11
Gross conversion				

efficiency (%)	25.6	87.97	100.69	55.05
Net conversion efficiency (%)	71.41	112.18	169.82	136.8



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