

## A Two-Day International (Web) Conference New Vistas in Aquatic & Terrestrial Biology and Environment During Current Pandemic (ATBE-2021)

26 & 27 March, 2021

Department of Zoology R.S.S.P. Mandal's Nanasaheb Y. N. Chavan Arts, Science and Commerce College Chalisgaon,  
Dist. Jalgaon (M.S.) India.

### Effects of Dietary Bitter Gourd (*Momordica Charantia*) On Growth Performance of Indian Major Carp (*Labeo Rohita*) Fingerlings

<sup>1</sup>Shivaji G Jetithor, <sup>2</sup>Datta A.Nalle

<sup>1</sup>Department of Fishery Science, Yeshwantrao Chavan Mahavidyalaya, Tuljapur Dist. Osmanabad (M.S.) India

<sup>2</sup>Department of Zoology & Fishery Science, Rajarshi Shahu Mahavidyalaya (Autonomous) Latur (M.S.) India

Email – <sup>1</sup>shivajijetithor@gmail.com, <sup>2</sup>iprometheous007@gmail.com

**Abstract:** In this experimental study we were designed five experimental diets with containing changeable concentration of five experimental diet was prepare by various concentration of Bitter gourd (*Momordica charantia*) powder as. 25g/kg(D2), 50g/kg(D3), 75g/kg (D4) and 100g/kg(D5). with full fat soybean diet D1 used as control where no Bitter gourd were used. at the end of the experiment we were note that Initial weight, final weight, weight gain, specific growth rate and survival rate of labeo rohita fingerlings were significant . The highest weight gain and specific growth rate values, at the end of the experiment. FCR and PER values were also recorded in fish fed D3 (50g/kg of diet) and D4 (75g/kg of diet). Fish fed Bitter Gourd significant differences were recorded in the survival rate among groups best survival rate was found at D3 and D4 followed by D5 ( $p > 0.05$ ). it clearly indicates that from 50 to 75 gram per kilo gram of bitter gourd work better than full concentration i.e. 100 gram per kilogram of diet. Energy utilization (EU, %) were noted significantly good at D3 and D4 followed by D5 D2 and control D1 which shows fishes respond well to dietary bitter gourd as supplement.

**Key words:** Bitter gourd (*Momordica charantia*), Growth performance, Indian major carp (*labeo rohita*) fingerling.

#### 1. INTRODUCTION:

Now a day's many commercial diets come in market for fishes but most of diet had been made with routine formulation .which fulfill minimum body requirement in fishes. Mineral elements play important role for fish body. They are calcium, phosphorus, sodium, molybdenum, chlorine, magnesium, iron, selenium, iodine, manganese, copper, cobalt and zinc.(1) .when we tally various research article we find that least attempt carried out in terms of calcium need for labeo rohita.also next side is that no attempt had been carry out use of bitter gourd in diet. Many study related its mineral composition shows that One cup (94 grams) of raw bitter melon provides **Carbohydrates:** 4 grams, **Fiber:** 2 grams, **Vitamin C:** 93%, **Vitamin A:** 44% of the RDI, **Folate:** 17% of the RDI, **Potassium:** 8% of the RDI, **Zinc:** 5% of the RDI, **Iron:** 4% of the RDI. Bitter melon is especially rich in vitamin C, an important micronutrient involved in disease prevention, bone formation, and wound healing .It's also high in vitamin A, a fat-soluble vitamin that promotes skin health and proper vision .(2) .so in present investigation fish diet is formulating to check its effect on fish health status.

#### 2. MATERIALS AND METHODS:

Labeo rohita fingerlings were obtained from local fish supplier Latur . Fish were acclimatized to the laboratory conditions for 20 days. Water quality parameters were monitored on a weekly basis throughout the experimental period using the standard APHA methodology (3.) By the mean of multi-purpose water meter (YSI 600 XL, Xylem Inc., USA). The parameters are; water temperature ( $21 \text{ }^\circ\text{C} \pm 0.2$ ), dissolved oxygen ( $6.1 \pm 0.2 \text{ mg/l}$ ) and pH ( $7.5 \pm 0.4$ ). Fish were fed the test diets until visual apparent satiation, 7 days a week for 60 days. Fish in each aquarium were counted and weighed biweekly throughout the experiment. Total amount of feed consumed by the fishes in each aquarium, during the study, after that feed consumed for each individual fish was calculated consequently.

##### 1. Preparation of experimental diet:

Bitter gourd was obtained from the local market. Dried and made it to convert powder form. After that five experimental diet was prepare by various concentration as. 25g/kg (D2), 50g/kg (D3), 75g/kg (D4) and 100g/kg (D5). With full fat soybean diet D1 used as control where no Bitter gourd were used. Ingredients of the diet shown in table 1

collection of data and analysis of sample

After 60 days, the fishes of each aquarium were weighed collectively and average final weight (g/fish) was calculated.

2. Determination of some Growth Parameters:

ingredients	Experimental diets				
	Diet 1	Diet 2	Diet 3	Diet 4	Diet 5
Groundnut cake	65.0	65.0	65.0	65.0	65.0
Rice bran	4.20	4.20	4.20	4.20	4.20
Wheat flour	3.20	3.20	3.20	3.20	3.20
Processed soybean <sup>a</sup>	26.60	26.60	26.60	26.60	26.60
Bitter grout	.....	25g*	50g*	75g*	100g*
g* Grams per 1 kg of diet					

Total length, and weight, liver and viscera weights and gut length were recorded for the purpose of determining growth parameters viz HIS- hepatosomatic index, VSI- viscerosomatic index, CF-condition factor and RIL-relative intestine length.

Hepatosomatic index (HSI) was determined according to Busacker (4) as using formula:  $HSI = 100 \text{ [liver weight (g)/ total body weight (g)]}$ ; Viscerosomatic index (VSI) was estimated according to Ricker (5) as using formula:  $VSI = 100 \text{ [viscera weight (g)/ total body weight (g)]}$ , CF was estimated according (6);  $CF = 100 * (TW/TL^3)$  where; TW: Total fish weight (g); TL: Total fish length (cm). Relative intestine length (RIL) was determined according (7) as using formula:  $RIL = \text{absolute intestine length (cm)/ TL (cm)}$ .

3. RESULTS:

Initial weight, final weight, weight gain, specific growth rate and survival rate of labeo rohita fingerlings are presented in Table 2. The highest weight gain and specific growth rate values, at the end of the experiment . FCR and PER values were also recorded in fish fed D3 (50g/kg of diet) and D4 (75g/kg of diet) . Fish fed Bitter Grout significant differences were recorded in the survival rate among groups best survival rate was found at D3 and D4 followed by D5 ( $p > 0.05$ ).it clearly indicates that from 50 to 75 gram per kilo gram of bitter gourd work better than full concentration i.e.100 gram per kilogram of diet.

Energy utilization (EU, %) were noted significantly good at D3 and D4 followed by D5 D2 and control D1 which shows fishes respond well to dietary bitter gourd as supplement.

Growth performance and feed utilization efficiency

Table 2. Effect of different levels of Bitter gourd (*Momordica charantia*) on growth performance of labeo rohita fingerlings under laboratory condition

ingredients	Experimental diets				
	Diet 1	Diet 2	Diet 3	Diet 4	Diet 5
Initial body weight (IW, g/fish)	1.51 ± 0.1	1.78 ± 0.1	1.98 ± 0.1	1.79 ± 0.1	1.99 ± 0.1
Final body weight (FW, g/fish)	7.25±0.05b	7.31±0.05b	7.11±0.19b	8.60±0.36a	8.2±0.52ab
Total weight gain (TWG, g/fish)	5.14±0.51b	5.43±0.51b	5.3±0.19b	6.70±0.37a	6.31±0.52ab
Specific growth rate (SGR, %/d)	1.14±0.01b	1.15±0.01b	1.29±0.04b	1.31±0.07a	1.29±0.09ab
Feed conversion ratio (FCR)	2.02±0.06a	2.02±0.06a	1.79±0.03b	1.41±0.07b	1.71±0.14b
Protein efficiency ratio (PER)	1.02±0.03b	1.04±0.03b	1.29±0.01ab	1.26±0.05a	1.31±0.1a
Protein productive value (PPV)	19.15±0.63b	20.18±0.63b	30.60±0.49a	33.67 ± 1.03a	29.06 ± 2.26a
Energy utilization (EU, %)	10.11±0.33b	11.09±0.33b	9.20±0.16c	11.74±0.47a	9.81±0.71b
Survival rate (SR, %)	90 ± 2.08	95 ± 2.08	100 ± 0	100 ± 0	99 ± 2.08
Initial body weight (IW, g/fish)	1.62 ± 0.1	1.88 ± 0.1	1.88 ± 0.1	1.89 ± 0.1	1.89 ± 0.1

4. DISCUSSION:

Using of natural feed additive is becoming useful for fish feeding rather than classic chemical feed additives due to the accumulative effect of the chemical components induced deterrent effects on consumer health. The use of medicinal and aromatic plants in fish diets is still limited, this being expert only at experimental scale.

In the present study an improvement in *labeo rohita* fingerlings growth and feed utilization index was recorded when fish fed diet containing Bitter Grout seed when compared with either Bitter Groutleaves or control diet but survival rates were insignificantly affected among groups. Superiority of using seeds rather than leaves in growth performance may be explained by that seeds contain much higher content of protein and lipid relative to leaves and also Bitter Grout seeds contain active compounds such as planteose, mucilage, polysaccharides and fixed oil that consists of linoleic acid (50%), linolenic acid (22%), oleic acid (15%) as well as 8% unsaturated fatty acids (8). Bitter Grout leaves extract improves growth and specific growth rate and lowers FCR of common carp (*Cyprinus carpio*) at 4% and 8% inclusion levels in fish diet, however, the survival was not affected ( $P > 0.05$ ) by basil-supplemented diets (9.). Also incorporation of dried Bitter Groutleaves in Hybrid Tilapia, *Oreochromis niloticus* X *Oreochromis aureus*, fingerling diets improved growth rate significantly ( $P < 0.05$ ) than the control diet especially at 2% dried basil leaves which achieved the best inclusion level (10.). Reported that chicks fed diet supplemented with Bitter Grout at 3 g/kg diet had the best FI, FCR, live body weight and feed efficiency. In European sea bass *Dicentrarchus labrax* species after the administration of 1% thyme in fish diet. no attempt was found related dietary use of bitter grout.

Above research noted the utilization of dietary Bitter Grout is not only useful for fish but all animals. Utilization of natural content in diet is needful for recent period.

## 5. CONCLUSION:

The present investigation showed a significant improvement of fish growth, feed utilization and digestive activities by the administration of Bitter Grout to *labeo rohita* fingerlings diet as compared to the control. The beneficial effects of using Bitter Grout on fish growth appear to be associated with significant growth parameter. More research is necessary to evaluate Bitter Grout supplementation in *labeo rohita* fingerlings diet according to its digestibility, amino acid profile and content of anti-nutritional factors.

## REFERENCES:

1. K. W. Chow FAO: <http://www.fao.org/3/x5738e/x5738e08.htm>
2. <https://www.healthline.com/nutrition-team>
3. A.P.H.A. American Public Health Association, (1995): Standard Methods for Examination of Water and Waste Water (18th edition) Washington D.C, USA.
4. Busacker, G.P., Adelman, I.R., Goolish, E.M., (1990): Growth. In: Schreck, C.B., Moyle, P.B. (Eds.), Methods for Fish Biology. American Fisheries Society, Bethesda, Maryland, pp. 363–387
5. RICKER, W. E. [ED.]. (1968): Methods for assessment of fish production in fresh waters. IBP Handbook No. 3. F. A. Davis, Philadelphia, Pennsylvania. 328 p.
6. Fulton, T.W., (1904): The rate of growth of fishes. 22nd Ann. Rep. Fish. Board Scotland 3:141-241
7. Al-Hussaini, A.H., (1949): On the functional morphology of the alimentary tract of some fish in relation to differences in their feeding habits: anatomy and histology. Journal of Microscopical Science 90 (2):109-139.
8. P.H. List, L. Hörhammer Hagers (1977): Handbuch der Pharmazeutischen Praxis (fourth ed.), Springer Verlag Berlin-Heidelberg, Germany Band VI A.
9. Amirkhani, N., Firouzbakhsh, F., (2013): Protective effects of basil (*Ocimum basilicum*) ethanolic extract supplementation diets against experimental *Aeromonas hydrophila* infection in common carp (*Cyprinus carpio*). Aquac. Res.1–9.
10. El-Dakar, A.Y. (2004): Growth response of hybrid tilapia, *Oreochromis niloticus* x *Oreochromis aureus*, to diets supplemented to different levels of caraway seeds. Agric. Sci. Mansoura Univ., 29: 6083-6094.