

A COMPARATIVE STUDY ON THE MORPHOMETRIC AND NUTRITIONAL INDICES OF XIPHOPHORUS HELLERI CATERED WITH COMMERCIAL AND DOMESTIC FEED.

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Abstract: Our work intends to investigate a comparative study on the morphometric data and nutritional evaluation in *Xiphophorus helleri* provided with commercial and domestic feed. The result revealed better mean length gain (1.30 ± 0.360 cm), mean weight gain (0.95 ± 0.051 g), SGR (1.59 ± 0.068), FCR (0.113 ± 0.003) and survival rate (90%) in domestic feed (DF) compared to a commercial diet. It was devoid of proximate composition when bought for the study (CF) yielded decelerated values of mean length gain (1.23 ± 0.115 cm), mean weight gain (0.91 ± 0.072 g), SGR (1.51 ± 0.0005), FCR (0.133 ± 0.004) with survival rate of 80% thereby necessitated the selection of accurate feed to flourish the bio stress reliever i.e., the ornamental fishes.

Keywords: *Xiphophorus helleri*, morphometric data, nutritional evaluation, SGR, FCR, survival rate.

I. Introduction

Ornamental fisheries sector in its zenith buoyed up the economic status between foreign and domestic trade improved the living condition of developed, developing, underdeveloped nations as well. The nutrient requirements seemed lacking over past years derived from research events in aquatic industry with limited application in ornamental fishes [1] prompted the inculcation of live feeds like *Chironomus* larvae, *Tubifex*, *Moina* and *Artemia* cysts along with formulated feeds enhanced growth and reproduction. The improper unhealthy feeding schedules transmitted diseases thereby shatters the profit can be effectively alleviated by proper feed [2].

Among the lion's share feeds available in Aqua shops some of them evident with concealed proximate composition. Considering the prevailing scenario our work intends to investigate a comparative study on the morphometric and nutritional evaluation in *Xiphophorus helleri* provided with commercial and domestic feed.

II. Material and methods

The experimental domestic feed was prepared using the ingredients like rice bran powder, ground nut oil cake, prawn powder and wheat as a blender whose proximate analysis along with commercial feed analysed by standard methods [3] denoted in Table-1. Gross energy content, Metabolizable energy, ME/DE coefficient were also calculated. [4-6]. Feeding experiments carried out in indoor system using two glass aquaria with 30L capacity. The red sword tail fishes (*X. helleri*) procured from Achu's aquarium, Kollam district, Kerala subjected to an acclimatization period of two weeks. Five fishes randomly introduced into the respective tanks labelled as CF and DF whose proximate analysis carried out by standard methods denoted in Table-1. The fishes reared with standard water quality parameters [7] introduced into the respective tanks after measuring their initial length and weight fed with 3% feed later collected at the end of experiment (45days) to calculate the morphometric and nutritional indices [8-9].

III. Results and Discussion

The proximate analysis of feed clarified the amount of crude protein, crude lipid, moisture content, Ash, Fibre, NFE, Gross Energy, ME:DE Coefficient and Metabolizable energy in CF and DF denoted in Table-1

Table-1 showing the proximate chemical composition of 100 g.

Feed parameters	CF	DF
Crude protein	19.2	27.7
Crude lipid	1.4	4.0
Moisture	11.1	12.5
Ash	13.32	13.7
Fibre	2.0	2.1
NFE	52.98	40.0
Gross energy	3.12	3.45
ME:DE Coefficient	99.50	99.73
Metabolizable energy	10.39	11.14

In the study conducted length gain, weight gain, SGR and survival rate obtained was highest for the domestic feed (DF) as compared to the commercial feed (CF) represented in Table-2 thus clearly demonstrated the growth promoting ability of homemade diet.

Table-2 showing the morphometric and nutritional indices of CF and DF fed fishes.

Diet	Mean Length gain(cm) ± SD	Mean Weight gain(g) ± SD	Mean SGR(%) ± SD	Mean FCR(%) ± SD	Survival(%)
CF	1.23 ± 0.115	0.91 ± 0.072	1.51 ± 0.005	0.133 ± 0.004	80
DF	1.30 ± 0.360	0.95 ± 0.051	1.59 ± 0.068	0.113 ± 0.003	90

The morphometric and nutritional indices obtained were promising for DF compared to CF. The supplementation of domestic feed enriched with better nutrients promoted growth and improved survival of sword tail [10-11]. In our study the survival rate obtained, gain in length and weight favoured the dietary inclusion of DF feed than CF thereby agreed findings in *X.helleri* and *X.maculatus* [12-15]. The result obtained concur the application of [16] 3 botanical additives (Coriander, Mint and Amaranth leaves), increased the body colouration of gold fish with specific growth rate in *S.glanis* when fed with carotenoid rich microalgal biomass. *Curcuma longa* yielded better growth in *Poecilia reticulata* [17] also support the promotion of plant incorporated. Palatable nature of feed with proper hydrological parameters were against the negative influence of *Rosa rubiginosa* [18] on the survival of *X.helleri*.

IV. Conclusion

From the study conducted arrived at a conclusion that sufficient feed should be selected to supplement our stress relievers i.e. the ornamental fishes.

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References

- [1] Sales, J and G. P. J. Janssens, (2003). Nutrient requirements of ornamental fish. *Aquat. Living. Resource.*, 16:553-540.
- [2] M. C. Pannevis, Nutrition of ornamental fish, In: I.H. Burger, (Ed.), *The Waltham Book of Companion Animal Nutrition*, Pergamon Press, Oxford, 1993, pp: 85-96.
- [3] AOAC. (2005). Official methods of analysis of AOAC, 18th edition, In: Horwitz, W. (Ed.), AOAC, Washington. D.C., 1094.
- [4] Jobling. M. (1983). A short review and critique of methodology used in fish growth and nutritional studies. *J. Fish. Biol.*23:685-703.
- [5] Lee, P.G. and Lawrence, A. L. (1997). Digestibility. In: D' Abramo, L/R/, Conklin, D.E., Akiyama, D. E. (Eds.), *Crustacean Nutrition*. World Aquaculture Society, Baton Rouge, LA, USA, pp. 194-260.
- [6] Noblet, J., X. S. Shi and S. Dubois, (1993). Metabolic utilization of dietary energy and nutrients for maintenance energy requirements in sows: basis for a net energy system. *Br. J. Nutr.* 70:407-419.
- [7] APHA. (2005). Standard methods for the examination of water and waste water. 18th. Ed., American Public Health Association DC. *Aquaculture* 17:63-92
- [8] Utne, F. (1979). Standard methods and terminology in fin fish nutrition and fish feed technology, Ed: Malver, J. E and Tiews. 11.
- [9] Bhavan Saravana, S., Mohammedsiddiq, V., Srinivasan, T., Muralisankar., Manickam, M. (2014). Effects of Seeds of Medicinal Plants, *Syzygium cumini*, *Phyllanthus Emblica*, *Azadirachta Indica* and *Ricinus Communis* on Growth Promotion in *Macrobrachium Malcolmsonii* Early Juveniles. *International journal of Research Studies in Biosciences (IJRSB)*. 2(11):95-106.
- [10] Divya, M.S and Dr. Sreeja.J. (2017). Phytochemical Analysis of *Myristica fragrans* in different solvents. Proceedings of the National Seminar On Blue Economy: Fostering Sustainable Development and Profitable Resource Utilization. ISBN 978-93-85752-56-8. 73-76.
- [11] Murthy and Kiran, B.R. (2013). Review on usage of medicinal plants in fish diseases. *Int J Pharm Bio Sci.* 4(3): 975-986.
- [12] Ezhil J., C. Jeyanthi and M. Narayanan (2008). Marigold as a carotenoid source on pigmentation and growth of red sword tail, *Xiphophorus helleri*. *Turkish Journal of Fisheries and Aquatic Sciences*, 8:99-102.
- [13] Joseph B., Sujath S., Jemima S. J. and Palavesam A. (2011). Influence of Four ornamental flowers on the growth and colouration of orange sword tail Chicilidae fish (*Xiphophorus hellerei*, Heckel, 1940). *Int J Biol Med Res.*,2(3):621-626
- [14] Divya, M.S and Dr. Sreeja. J. (2016). Effect of plant extracts on growth and survival in *Xiphophorus maculatus* as an alternative to chemotherapy. International conference on Environmental Sustainability for food Security (ENFOSE-2016), 121.
- [15] Divya, M.S and Dr. Sreeja. J. (2016). Use of Plant Extracts in Ornamental Fish Culture as an Alternative to Chemotherapy. Proceedings of the International Conference on Environmental Stress and Aquatic Animal Health. ISBN 978-93-5258-826-8.
- [16] Rebecca Anne and Bhavan Saravana. (2013). Growth promotion and survival enhancement of the fresh water prawn *Macrobrachium rosenbergii* post larvae fed with *Allium sativum*, *Zingiber officinale* and *Curcuma longa*. *Int. J. Pure Appl.Zoo.*,2(2):138-149.
- [17] Arulvasu C., Ramya Meena S., Chandhirasekar D. and Sivaganam S. (2013). Evaluation of Natural Sources of Carotenoid Pigments from *Rosa rubiginosa* on Growth, Survival and Coloration of *Xiphophorus helleri* Fish Fry, *European Journal of Biological Sciences*. 5(2), 44-49.
- [18] Harpaz S. and Padowicz D. (2007). Color Enhancement in the Ornamental Dwarf Cichlid *Microgeophagus ramirezi* by addition of Plant Carotenoids to the Fish Diet. *The Israeli Journal of Aquacultur- Bamidgeh.*, 59(4):195-200.