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STUDY OF LENGTH-WEIGHT RELATIONSHIP AND PROTEIN RATIO OF SCHIZOTHORAX AND CARP

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ABSTRACT

The present investigation was carried out to compare feed based variations in *Schizothorax* sp. and *Carp* sp. The main objective of the experimental work was to assess: Variation in Length- Weight ratio, Changes in Protein content and Associated indicies like FCR, PER, PPV, Weight gain of *Schizothorax* and *Carp* sp. Okaya fish feed was taken for experimental work and the study was carried out from april to july 2014. There was a gradual decrease in weight gain, PER and PPV in both the species studied. However, a decreasing trend was observed with respect to FCR.

Keywords: *Carp, Fish Protein, Food Conversion, Schizothorax*

INTRODUCTION

Rearing of fishes has been known to humans from the beginning of the civilization. Fish plays an important role in the diet of human as a chief source of protein. The constituents of fish feed directly affect the growth of the fishes as deficiency of protein in the fish feed leads to stunted growth. The fish feed having high content of carbohydrate is not effective towards the growth of the fishes as fish requires less amount of carbohydrate.

Fish feed formulation is very important for growth of fishes and requires crude protein, specific amino acid, fibre and ash. Therefore, this work was carried out to compare the impact of artificial feed (Okaya) on *Schizothorax* and *Carp*.

MATERIALS AND METHODS

Two groups of healthy fishes of *Schizothorax* sp. and *Carp* sp. of different sizes were obtained from local fisherman of Srinagar city obtained from Dal lake and river Jehlum. Size and weight of the fish ranged from 3 to 17cm and 1-5g, respectively. Fish were acclimated in indoor tanks for two weeks before the commencement of the experiments.

The fish of mixed sex of each size were distributed randomly in glass aquaria containing 5 liters of aerated water. Three fishes were released in each aquarium. Aquarium was cleaned everyday for removal of excreta. Okaya fish feed was taken for experimentation. Fishes were fed everyday and were weighed every two days to record changes in length and weight. Protein was measured at an interval of 15 days till the completion of the experiment.

Other growth parameters like weight gain, FCR (food conversion ratio), PER (Protein efficient ratio) and PPV (Protein productive value) were determined using the method proposed by Sveier *et al.*, (2000). Dissolved oxygen, total hardness and chloride contents were measured by titrimetric method using sodium thiosulphate, EDTA and silver nitrate, respectively. Moisture Content of fish was estimated by dessication method.

However, total phosphate, orthophosphate and total protein content were estimate by spectrophotmetric method (Anonymous, 2005).

Food conversion ratio (FCR), protein efficiency ratio (PER) and protein productive value (PPV) were calculated by the following formula

FCR = feed intake/weight gain

PER = weight gain/protein intake

PPV = Protein gain/protein intake

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The data in table 1 depicts that there was a gradual decrease in weight gain in both the species studied. During initial month (April) weight gain decrease was higher in *Carp* sp. whereas after the month of May the decrease was higher in *Schizothorax* sp. FCR showed a fluctuating trend, from April to July both in *Schizothorax* sp. and *Carp* sp. Comparing the two fishes FCR showed higher tendency in *Schizothorax* sp.

Contrary to FCR, PER showed higher tendency in *Carp* sp. compared to *Schizothorax* sp. However, a decreasing trend was observed from April to July in both the species. Highest level of PER was observed during the month of April, in both the fishes where *Carp* sp. possessed 31% of higher level of PER compared to *Schizothorax* sp. (Table 1). PPV exhibited no change in *Schizothorax* sp. from April to July however in carp sp. there was a gradual decrease upto the month of June and in the month of July the value was zero.

Table 1: Comparative Effect of Artificial Feed on the Weight Gain (%), FCR (%), PER (%) and PPV (%) in *Schizothorax* and *Carp* (\pm = Standard Error)

Month	Weight Gain		FCR		PER		PPV	
	<i>Schizothorax</i>	<i>Carp</i>	<i>Schizothorax</i>	<i>Carp</i>	<i>Schizothorax</i>	<i>Carp</i>	<i>Schizothorax</i>	<i>Carp</i>
	<i>ax</i>		<i>ax</i>		<i>ax</i>		<i>ax</i>	
April	0.80 \pm 0.1	0.95 \pm 0.2	0.66 \pm 0.02	0.64 \pm 0.2	4.00 \pm 0.6	5.25 \pm 0.4	1.00 \pm 0.2	3.01 \pm 0.2
May	0.91 \pm 0.1	1.00 \pm 0.1	0.52 \pm 0.01	0.60 \pm 0.3	3.66 \pm 0.4	5.02 \pm 0.3	1.00 \pm 0.2	2.64 \pm 0.2
June	1.00 \pm 0.2	0.58 \pm 0.1	0.65 \pm 0.03	0.59 \pm 0.2	2.00 \pm 0.2	5.65 \pm 0.3	1.00 \pm 0.2	2.69 \pm 0.1
July	1.00 \pm 0.2	0	0.69 \pm 0.05	0	2.53 \pm 0.1	0	1.00 \pm 0.2	0

Artificial feed “Okaya” has a deep impact on growth rate of the fishes (Table 1), as it is found that the growth rate and protein content of *Carp* sp. increased over the months steadily as compared to that of *Schizothorax* sp. FCR generally becomes smaller with increase in the amount of protein formulated in diet. Length and weight relationship studies are important to analyze growth, age and other components of fish studies. Similar studies have been carried out by Cherif *et al.*, (2011) pertaining to relationship between 11 fish species from the Gulf of Tunisia and nine fresh water teleosts collected from river Ganga (Khan *et al.*, 2011). They reported variation in growth indices of different fishes. Nominal body weight was considered for calculation of the condition of lobster, since it is not influenced by the weight of the gonad and stomach contents (Papageorgious, 1979). Individual variations from length-weight relationships have been studied under the general condition (LeCren, 1951) whereas Length-weight relationship (LWR) is of great importance in fishery assessment (Goncalves *et al.*, 1996). Length and weight measurements can give information on the stock composition, life span, mortality, growth and production (Bolger and Connolly, 1989; Moutopoulos and Stergiou, 2000). Fish length and weight data have been studied to derive biological information. The length-weight relationship (LWR) is very important for proper exploitation and management of the population of fish species. LWR has a number of important applications in fish stock assessment and the same has been shown by Morey *et al.*, (2003). The exact relationship between length and weight differs among species of fish according to their body shape, and within a species according to the condition of individual fish (James, 2000). Condition sometimes also reflects food availability and growth but, factors and condition is always variable and dynamic. The present study is a small step towards finding variations in growth pattern with regard to the type of feed used for *Schizothorax* and *Carp* sp.

Conclusion

Fishes were found to grow normally under experimental conditions. *Carp* fed on Okaya feed showed significant growth rate compared to *Schizothorax*. Protein content of *Carp* increased over the months

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steadily as compared to that of *Schizothorax* sp. Length-weight relationship studies are important in determining the growth pattern and population composition pattern.

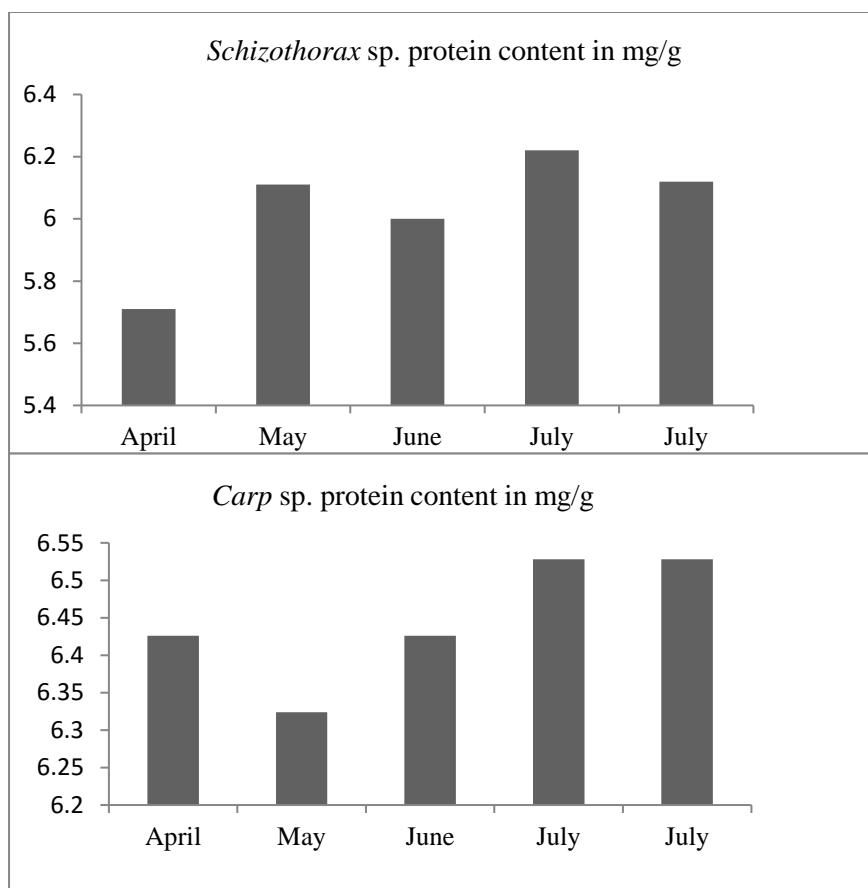


Figure 1: Effect of Artificial Food on Protein Content in *Schizothorax* and *Carp* sp at Different Stages of Growth

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