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European Journal of Zoological Research, 2014, 3 (2):23-27 (http://scholarsresearchlibrary.com/archive.html)



Study on variation in fish length, weight and protein ratio based on feed in *Tilapia sp.* and *Anabas sp.*

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ABSTRACT

The present investigation was carried out to compare feed based variations in Tilapia sp. and Anabas sp. The main objective of the experimental work was to assess: Variation in Length-Weight ratio, Changes in Protein content and associated indices like FCR, PER, PPV, Weight gain of Tilapia and Anabas sp. Okaya fish feed was taken for experimental work and the study was carried out from January-April, 2013.

Key words: FCR, PER, PPV, Feed, Protein

INTRODUCTION

Rearing of fishes has been known to humans from the beginning of the civilization. Aquaculture is associated with four major taxonomic groups: algae, molluscs, crustaceans and fish. 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.

MATERIALS AND METHODS

Two groups of healthy fishes of *Tilapia sp. and Anabas sp.* of different sizes were obtained from local fishermen of Cuttack. Size and weight of the fish ranged from 3 cm to 7cm and 1-5 g. Fish were acclimated in indoor tanks for 2 weeks before the commencement of the experiments. The fish of mixed sex of each size were distributed randomly in glass aquaria containing 5 litres of aerated water. Three fishes were released in each aquarium. Aquarium was cleaned every day for removal of excreta. Okaya fish food was taken for experimentation. Fishes were fed every day 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 experimental design. Other growth parameters like Weight gain, FCR, PER and PPV were determined using [6] Sveier et al. (2000) method. Basic water quality indices were tested based on Standard methods APHA. The water quality indices tested were DO, Total hardness, Chloride, Total Phosphate, Orthophosphate.

Table 1 Methods used for Experimentation

Dissolved Oxygen	Titrimetric (using Sodium Thiosulfate)
Total Hardness	Titrimetric (using EDTA)
Chloride	Titrimetric (using Silver Nitrate)
Total Phosphate	Spectrophotometric
Orthophosphate	Spectrophotometric
Moisture Content of fish	Dessicator based
Protein Estimation	Spectrophotometric

RESULTS AND DISCUSSION

Table 2. Protein content in Tilapia

Tilapia	protein content in mg
January	5.64
Feb	6.22
March	6.12
April	6.22
20-04-2013 April	6.12



Fig.1 Protein content in *Tilapia* from January – April (in mg)



Fig.2 Protein content in Anabas from January – April (in mg)

Table 3. Protein content in Anabas

Anabas	protein content in mg
January	6.426
February	6.324
March	6.426
April	6.528
April	6.528

Moisture Content

Total moisture content in *Anabas* 50% Total moisture content in *Tilapia* 75%





Table	4.	FCR,	PER	and	PPV	calculation	chart
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Weight gain= W2- W1	
W2=Final fish weight	
W1=Initial fish weight	
Food conversion ratio(FCR)	Feed intake/Weight gain
Protein efficient ratio(PER)	weight gain/Protein intake
Protein productive value(PPV)	Protein gain/protein intake

Table 5. FCR, PER and PPV of T	'ilapia sp
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Tilapia sp.[January-April 2013]				
Weight gain	FCR	PER	PPV	
1.25	0.6	4.75	1	
0.5	0.8	3.1	1	
0.65	0.6	4.16	1	
1	0.65	3.8	1	
1	0.4	3.63	1	
0.75	0.67	3.56	1	
1	0.7	3.6	1	
1	0.6	0.41	1	
1	0.67	2.77	1	
1	0.7	2.3	1	

Anabas[January-April 2013]					
Weight gain	FCR	PER	PPV		
1.35	0.56	5.75	3.88		
0.5	0.8	4.7	2.4		
1	0.56	5.13	2.76		
1	0.7	4.8	2.4		
1	0.56	5.13	2.76		
1	0.56	5.13	2.76		
0.5	0.7	4.8	2.4		
0.65	0.47	6.15	2.97		
0	0	0	0		

 Table 6. FCR, PER and PPV of Anabas sp



Fig.4 FCR, PER and PPV of Anabas sp.



Fig.5 FCR, PER and PPV of Tilapia sp.

From the above conducted experiment, it has been found that Okaya feed has a deep impact on the growth rate of the fishes, as it is found that the growth rate and protein content of *Anabas sp.* increased over the months steadily as compared to that of *Tilapia 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 [1]Mourad et al in 2008 pertaining to relationship between 11 fish species from the Gulf of Tunisia. 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[9] (Papageorgious, 1979). Individual variations from length-weight relationships have

been studied under the general condition [7](LeCren, 1951) whereas Length-weight relationship (LWR) is of great importance in fishery assessments [3] (Goncalves *et al.*,1996). Length and weight measurements can give information on the stock composition, life span,mortality, growth and production [2](Bolger and Connoly, 1989; [8]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 [5] 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 [4] (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 *Tilapia* and *Anabas sp*.

CONCLUSION

Fishes were found to grow normally under experimental conditions. *Anabas* fed on Okaya feed showed significant growth rate compared to *Tilapia*. Protein content of *Anabas* increased over the months steadily as compared to that of *Tilapia sp.* Length-Weight relationship studies are important in determining the growth pattern and population composition pattern.

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