



Effects of dietary onion on growth performance in the fresh water fish *Clarias batrachus* (Linn.)

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Abstract

The aim of this study was to assess the effect of onion (*Allium cepa*) on growth performance in the fresh water fish *Clarias batrachus* (Linn.) A total number of 80 fish (average weight 20.86 ± 0.27 g) was used. Fish were divided into four groups fed on diets containing onion in different levels and the control group diet was without onion. The experiment extended for two months. The results showed significant weight gain and growth performance increased in all groups fed on onion. The results of this study show that addition of onion *Allium cepa* to fish diet can promote growth of fish.

INTRODUCTION

Inclusion of feed additives in diets of fish is goal to improve the growth performance, immunity and quality of meat. The investigation for novel feed additives is quiet a very imperative point for aquaculture investigators (Cho and Lee, 2012). Onion (*Allium cepa*; local name *Kanda* or *Pyaz*) is the most important commercial vegetable spice crop grown in India and exported. Onion leaves and immature bulbs are consumed as vegetable. It is mixed in other vegetables and soups as spice and flavouring agent. Onion is well known for its mineral and vitamin content as it is rich with vitamin B and C with various regulatory minerals as Ca, Fe, Mg, k, Cu (Gabor *et al.*, 2010). Onion is also known for its medicinal properties as an antibiotic, antiseptic, anti-infectious, antibacterial and antifungal agent (Benkeblia, 2004). It is also an antioxidant and has anticancer properties (Ramos *et al.*, 2006; Bello *et al.*, 2012 a).

The onion can be use as one of the common food for animal as it has several aforesaid important applications (Bello *et al.*, 2012 a; Cho and Lee,

2012; Saleh *et al.*, 2015) but its effect in fresh water fish *Clarias batrachus* is not well known. Hence the presented study aim to assess the effects of dietary onion on growth performance in fresh water fish *Clarias batrachus* (Linn.)

MATERIAL AND METHODS

Experimental fish: The *Clarias batrachus* (20.88 ± 0.25 g) were obtained from a commercial farm and were transferred to the place of experiment and acclimated for 2 weeks. During the acclimation, fish were fed the experimental diet to satiation twice a day at 09:00 and 15:00 hours. After acclimation, fish were fasted for one day; batch weighted and randomly distributed among density of 20 fish per tank (Gulhane *et al.*, 2015).

Experimental diet and feeding regime: The basal experimental diets were formulated with the commonly available ingredients. The formula and analyzed proximate composition of the basal diet are shown in Table 1. The ingredients were grinded, milled, weighed, mixed and pelleted with meat mincer through a 2 mm die.

After pelleting, the feeds were air dried and put in an air-tight container. During the experiment, fish were fed the experimental diet to satiation third a day at 08:00, 12:00 and 16:00 hours.

Measurements and sample analysis: It was carried out each 20 days. Water temperature was 15°C, O₂ 7-8 mg/l, pH 7-8 and light: dark cycle of 12:12 h

was maintained during the feeding trial. Proximate composition of diets and tissues were carried out using the Association of Analytical Chemists (AOAC, 1995) methods.

Calculations and statistical analysis: The following variables were calculated:

- a) Body weight increase (BWI) = $W_t - W_0$ (Tacon, 1990)
- b) Specific growth rate (SGR) = $(\ln W_t - \ln W_0) \times 100 t^{-1}$ (Gulhane *et al.*, 2015)
- Where, W_t and W_0 = Final and initial fish weights (g), respectively, (t) = the experimental period in da
- c) Feed conversion ratio (FCR) = $\frac{\text{Total dry feed consumed (g)}}{\text{total weight gained (g)}}$ (Shalaby *et al.*, 2006)
- d)
- e) The data obtained from the trial is expressed as mean (\pm SD).

Table 1. Formulation and proximate composition of the basal fish diets

Ingredients	Control	Onion diets Ingredients (g /100g diet)		
		I	II	III
Meat	25	25	25	25
Wheat	50	47	44	41
Soybean	20	20	20	20
Soybean oil	05	05	05	05
Onion Powder	00	01	02	03

Results and Discussion

Growth performances of the fishes after 60 days of feeding are summarized in Table 2. Third fish group had higher final weight, weight gain, and SGR than fish fed on other levels of onion and

control. The highest amounts of dry feed intake (g/fish/day) were seen in the same third fish groups. Results also show that FCR decreased significantly to 1.39 ± 0.01 in the third group.

Table 2: Effects of onion on growth parameters in fish fed on experimental diets (g/100g)

Parameters	Control	I	II	III
Initial weight (g)	020.82 \pm 0.29	020.78 \pm 0.08	020.80 \pm 0.30	020.84 \pm 0.28
Final weight (g)	095.15 \pm 3.09	103.64 \pm 3.92	109.41 \pm 3.83	113.76 \pm 2.61
BWI (g)	075.92 \pm 3.36	085.96 \pm 4.01	091.13 \pm 3.56	097.84 \pm 3.64
SGR	001.54 \pm 0.07	001.63 \pm 0.06	001.71 \pm 0.05	001.74 \pm 0.04
FCR	001.63 \pm 0.05	001.47 \pm 0.04	001.44 \pm 0.05	001.40 \pm 0.01
Feed intake (g)	118.16 \pm 1.31	124.53 \pm 2.36	119.39 \pm 1.53	128.12 \pm 2.16

It is clear that onion as a main vegetable extensively cultivated in many countries. It is used as food for humans as well as some animals and as remedy for several diseases, as reported in folk medicine (Saleh *et al.*, 2015). In this study the

highest growth performance was observed in fish fed diets containing onion especially on third combination. These results are also in well agreement with those obtained by Gabor *et al.* (2010) and Gabor *et al.* (2012).

Conclusions

From the obtained results, it could be recommended that onion (*Allium cepa*) can be used as a growth promoter in *Clarias batrachus* so it should be added to the fresh water fish diets.

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