Effect of Dietary Lasia (*Lasia spinosa* (L.) Thwaites) Extract on Growth Performance and Intestinal Histology in Hybrid Catfish (*Clarias macrocephalus x Clarias gariepinus*)

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ABSTRACT

Lasia (Lasia spinosa (L.) Thwaites) has long been used since ancient time for the treatment of various ailments in man. However, the use of this plant in fish culture as a natural feed additive in fish diets to improve growth rate has not yet been studied. Thus, the aims of this research were conducted to investigate the effects of lasia extract (LSE) on growth performance and intestinal histology of hybrid catfish (Clarias macrocephalus x C. gariepinus). Arial parts of lasia were extracted with 75% ethanol. Preliminary phytochemical screening was examined by using colorimetric assay. Fish with an average of initial weight of 7.00±1.00 g were divided into 4 treatments of 3 replications before being fed diets incorporated with different levels (0, 1, 3 and 5% based on dried weight) of LSE. Fish were fed ad libitum two times a day with a rate of 3% of live body weight for 8 weeks. Phytochemical prospecting of LSE exhibited the presence of flavonoids, terpenoids, phenolic compounds, steroids, saponins, coumarins, glycosides and anthraquinones. After a feeding trial, growth performance and feed utilization efficiencies of fish fed with the experimental diets were significantly improved when compared to the basal diet (P<0.05). Survival rate, intestinosomatic index and condition factor were not affected by the diets (P>0.05). Villi height, villi width, muscularis thickness, microvilli

height and goblet cell number of treated fish were significantly enhanced when compared to control fish (P<0.05). The heights of enterocyte, supranucleus and subnucleus were significantly decreased in middle and distal part of intestines (P<0.05). The results demonstrated that LSE could be useful as a natural feed additive in fish diets in order to enhance growth and intestinal histology of hybrid catfish. The optimal level of LSE observed in this present research was 3%.

Keywords: Hybrid Catfish, Lasia, Growth performance, Intestinal histology, Feed additive

INTRODUCTION

Medicinal herbs and their products have long been used since ancient time for the treatment of various ailments in man (Elvin-Lewis, 2001). However, their uses as growth promoters, immunostimulants and other purposes in aquaculture operations are still being elucidated (Citarasu, 2010; Chakraborty et al., 2014). Several synthetic compounds such as hormones and antibiotics have led to the development of residual effects in aquaculture products and the creation of resistant strains of bacteria (Citarasu, 2010; Chakraborty et al., 2014; Yang et al., 2015). Thus, natural plant products seem to be more attractive alternatives to enhance growth, productivity and healthiness of fish (Heidarieh et al., 2012; Munglue, 2014, 2015, 2016).

Many herbal plants containing phytohormones have been used in fish cultures in order to enhance sex-reversal, growth and production of fish, while the success is still questionable (Turan and Akyurt, 2005a; Turan, 2006; Chakraborty et al., 2014). It was found that tilapia (*Oreochromis aureus* L.) received 100 mg/kg red clover (*Trifolium pratense*), a rich source of phytoestrogens, enriched diet for 90 days significantly increased growth rate, feed utilization efficiency and carcass crude protein composition when compared to the control fish (Turan, 2006). In addition, diets supplemented with *Tribulus terrestris* extract at the concentration of 400 mg/kg had a positive effect on weight gain, specific growth rate and feed conversion ratio in Nile tilapia (*Oreochromis niloticus*) (Gültepe et al., 2014). Turan and Akyurt (2005b) reported that African catfish (*Clarias gariepinus*) fed diets supplemented with red clover extract at the level of 75 mg/kg significantly increased in growth performances and carcass protein and lipid contents when compared with the control fish. From the above it can be appreciated that plants containing phytohormones such as phytoestrogens and phytoandrogens could act as natural growing promoting agents to improve fish growth and production (Pace et al., 2006; Chakraborty et al., 2014).