

Efficacy of Boiled Tea Leaf Residues in Diets for *Oreochromis niloticus* and Its Effect on Liver and Whole Body Composition

Obwanga, B. O.¹, Liti, D.², Wathuta, E. M.¹, Magana, A. M.¹, Waidbacher, H.³ and Njoroge, R. W.⁴

¹Department of Biological Sciences, Egerton University, P. O. Box 536, Egerton

²Department of Biological Sciences, Moi University, P. O. Box 1125, Eldoret

³BOKU University, Vienna, Austria

⁴Sagana Aquaculture Centre

E-mail: obwangaz@yahoo.com

Abstract

Challenges facing production of Nile tilapia *Oreochromis niloticus*(L.)in Kenya today lie in identification of cost-effective feeds. Proximate analysis on boiled tea leaf residues normally considered as kitchen waste showed a potential of using them in diets used for culture of *O. niloticus*. An 8-week feeding trial was conducted to determine the effect of substituting freshwater shrimp meal as a protein source with boiled tea leaves residues from diets used to culture Nile tilapia, *O. niloticus* in aquaria (initial mean weight 12.36 ± 1.1 g fish⁻¹; mean length 8.43 ± 0.27 cm fish⁻¹) and in hapas (initial mean weight 10.98 ± 0.75 g fish⁻¹. and mean length 8.77 ± 0.3 cm fish⁻¹). The effects of the substitution were determined by assessing the fish growth performance, resulting whole body composition and effect on the Hepatosomatic index (HSI). Four isonitrogenous (300g/kg) practical diets were formulated to contain 0%, 25%, 50% or 100% boiled tea leaves residues meal (BTLR). 0% BTLR (Sagana diet) was used as the control. Diets were fed to fish in glass aquaria and in hapas in a pond. All fish were fed 10% of their body weight in triplicates. Results showed no significant difference ($P > 0.05$) between the diets and the control up to 50% BTLR in hapas. However for fish cultured in the aquaria there was a significant ($P < 0.05$) difference between the control diet and increasing inclusion in BTLR in the diet. The diet had the same effect ($P > 0.05$) on the whole body chemistry (moisture, total ash and crude protein) in the fish raised in hapas. In glass aquaria total body ash increased ($P < 0.05$) significantly with increase in BTLR inclusion. Crude protein decreased significantly at 100% BTLR. The HSI was significantly ($P > 0.05$) high at 100% BTLR in hapas, while in the aquaria there was a significant increase in hepatosomatic index with increase in BTLR inclusion. The study concludes that boiled tea leaves residues can successfully substitute freshwater shrimps up to 100% in fertilized ponds without an adverse effect on the whole body moisture, crude protein and total ash. However in recirculating systems BTLR cannot substitute freshwater shrimps from diets used for culture of Nile tilapia *Oreochromis niloticus*. The study recommends the use of boiled tea leaf residues in formulated diets for culture of *O. niloticus* in fertilized ponds by small scale farmers to reduce on the cost of fish culture.

Keywords: *Oreochromis niloticus*, Boiled tea leaves residues, growth performance whole body chemical composition and Hepatosomatic index.