

Evaluation of *Suaeda aegyptiaca* as a Partial Replacement for Wheat Bran in Diets of Nile Tilapia (*Oreochromis niloticus*) Effects on Growth Performance and Feed Conversion under laboratory conditions

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Abstract

The use of alternative feeds is a modern trend in aquaculture aimed at reducing production costs and maintaining productive efficiency. This study aimed to evaluate the growth performance of *Oreochromis niloticus* fish when wheat flour was replaced with *Suaeda aegyptiaca* (salt-producing plant) powder at ratios of 0, 25, 50, and 100%. Ninety-six fish with an average initial weight of 47.28 ± 0.68 g were used. They were randomly distributed into 12 plastic tanks ($30 \times 30 \times 60$ cm) at a density of 8 fish per tank. The experiment was designed as a four-treatment system with three replicates per treatment. The fish were fed the experimental diets for 60 days at a daily feeding rate of 3% of their body weight, with adjustments made every 15 days. Statistical analysis revealed significant differences ($P < 0.05$) in Favor of the 25% substitution treatment in final weight, total and daily weight gain, relative and qualitative growth rates, and feed conversion ratio, compared to the other treatments. In contrast, no significant differences ($P > 0.05$) were observed between the 50% and 100% treatments in the studied growth indicators. The 25% treatment achieved the highest weight gain (75.10 g), the best relative (58.94%) and qualitative (1.103%/day) growth rates, and the best feed conversion efficiency (2.16). These results indicate the potential for substituting up to 25% of wheat flour with *S. aegyptiaca* plant powder without negatively impacting growth performance or feed conversion efficiency, thus supporting its use as an alternative feed source in Nile tilapia diets within sustainable aquaculture systems.

Keywords: Tilapia nutrition, halophytic plants, wheat bran replacement, feed conversion ratio, plant protein, aquaculture feed.

Introduction

Aquaculture, especially fish farming, is one of the most important food-producing sectors on a global basis, as the increasing population has led to an increase in the need for it, and thus the intensification of production and aquatic feed (Karlsen & Skov, 2022).

