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The Effects of probiotic *Saccharomyces cerevisiae* and *Lactobacillus rhamnosus* on the growth factors and serum biochemistry of *Oreochromis niloticus*

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Abstract

In this study, the effects of a feeding combination of *Saccharomyces cerevisiae* and *Lacticaseibacillus rhamnosus* on the growth and serum biochemical indices of Nile tilapia (*Oreochromis niloticus*) was investigated. For this purpose, a total of 300 Nile tilapia were divided into 10 groups (average weight: 20±7 g) and fed diets containing varying levels of yeast and bacteria for 60 days (30 fish in each treatment group, 10 fish in three replicates). Bacterial strain identification was performed using phenotypic, biochemical, and genetic characteristics. The control group was fed a commercial diet without the selected probiotic strains. Group 1 received only the bacterial strain, while groups 2 to 5 were fed diets containing different doses of yeast supplementation. Groups 6 to 9 received a combination of bacteria and yeast (commercial diet + 0.25%, 0.5%, 1%, and 1.5% yeast + bacteria). At the end of the trial, growth performance and serum biochemical parameters were analyzed. The results showed that the combination of these two probiotics improved the growth indices and the increased survival rates in fish. Additionally, significant changes were observed in some biochemical parameters, including an increase in HDL levels and glucose in yeast-fed groups that reflects the stress response. Instead of changes in biochemical results, based on the growth factors at the end of the study, a combination of *S.cerevisiae* and probiotic *L.rhamnosus* is a nutritional strategy for enhancing aquatic health and performance.

Key words: Probiotics, *Lacticaseibacillus rhamnosus*, *Saccharomyces cerevisiae*, Fish growth, Serum biochemical indices, *Oreochromis niloticus*

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