DOI: 10.22055/IVJ.2023.379766.2543

Synergistic Effects of Dietary β-glucan plus *Lactobacillus pentosus* and *Lactobacillus plantarum* as a Synbiotic on Growth Performance and Digestive Enzyme Activity of Juvenile Rainbow trout (*Oncorhynchus mykiss*)

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Received: 04.01.2023 Accepted: 26.11.2023

Abstract

Synbiotics, which are a combination of prebiotic and probiotic supplements, are one of the most commonly used feed additives in aquaculture. Present study was carried out to evaluate the effect of dietary supplement of two strains of intestinal bacteria *Lactobacillus plantarum* and *Lactobacillus pentosus* from the intestinal tract of the Shabot (*Tor grypus*) with β-glucan on growth performance and digestive enzyme activity of rainbow trout (*Oncorhynchus mykiss*) fingerlings. The fish were divided randomly into 8 treatment groups (for 60 days) containing control (group 1), 1% β-glucan (group 2), *Lactobacillus plantarum* (group 3), *Lactobacillus pentosus* (group 4), *Lactobacillus plantarum* + *Lactobacillus pentosus* (group 5), *Lactobacillus plantarum* with 1% β-glucan (group 6), *Lactobacillus pentosus* with 1% β-glucan (group 7), *Lactobacillus plantarum* + *Lactobacillus pentosus* with 1% β-glucan (group 8). After 60 days, the fish fed combination of two probiotics at equal proportion with 1% β-1,3-glucan (group 8) had higher growth performances than the other treatment groups. Digestive enzyme activities such as ALP, α-amylase, trypsin, lipase and protease in groups including probiotics and prebiotic, particularly in group 8 in parallel with growth performances, had higher than other groups. However, the enzyme activity of chemotrypsin had no significant difference between treatments. These results indicate that a combination of host-derived probiotics (*L. plantarum* and *L. pentosus)* with β-1,3-glucan has a significant potential as an important synbiotics to enhance the nutrients utilization and activity of digestive enzymes in rainbow trout juveniles; However, further research is needed to determine the proper supplement for this commercially valuable product.

Key words: Probiotic bacteria, Synbiotic, *Oncorhynchus mykiss*, Digestive enzymes, Growth performances

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