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Effects of different levels of dietary pectin on some immune parameters, antioxidant defense system of white leg shrimp (*Liptopenaeus vannamei*)

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Abstract

The aim of this study was to investigate the effects of pectin extracted from orange peel as a natural prebiotic on hemolymph indices, nonspecific immune parameters, antioxidant defense system, and digestive function of *Litopenaeus vannamei*. For this purpose, white leg shrimp with an average weight of 3 grams in four treatments; Control (without pectin), and three treatments of 0.5, 1 and 1.5% pectin were examined. Shrimps were fed with experimental diets for 2 months. Pectin consumption improved the number of total homocytes in all groups fed with pectin, hyaline homocytes in the group fed with 1% pectin and large granular homocytes in the group fed with 1.5% pectin level ($P<0.05$). However, it had no significant effect on shrimp survival and lysozyme level, total protein and glucose ($P<0.05$). Enzymatic studies in the present study showed an increase in catalase and superoxide dismutase activity in 0.5 and 1.5% pectin treatments. There was no statistically different in the activity of catalase and superoxide dismutase enzymes in the treatment with 1% pectin and the control treatment ($P<0.05$). The highest phenol oxidase activity was in the group fed with 1% pectin. However, the activity of this enzyme in the two treatments of 0.5 and 1.5% were not significantly different from the control group ($P<0.05$). The results showed that the addition of pectin to the diet improved the immunity and antioxidant defense system of leg white shrimp and the activity of antioxidant enzymes (such as catalase, superoxide dismutase and phenol peroxidase) increased significantly.

Keywords: Diet, Enzyme, Immunity, Pectin, White Leg shrimp

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