

Study of probiotic treatments and their effect on the expression of immune-related genes in aquatic animals

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Abstract

Disease prevention is always an important objective in aquaculture. Several studies have shown that non-specific immune systems can be stimulated by probiotics. Probiotics can directly activate the primary defense mechanisms through the effect on responsible receptors and genes, which in turn increases resistance to pathogens and types of environmental stresses. Probiotics also influence the expression of specific genes that regulate the immune system in fish, by creating a unique substance. The effect of *Lactobacillus plantarum* is an amazing example to show how immunity is controlled by probiotics in fish. Therefore, this study addresses probiotic treatments in the fish breeding industry and their implications for the expression of genes associated with the immune system.

Keywords: Aquaculture, Immune System, Probiotics, gene expression, *Lactobacillus plantarum*