EVALUATION OF IMMUNE GENE EXPRESSION AND PROTEIN LEVELS IN SMOLT SALMONIDS WITH *PISCIRICKETTSIA SALMONIS.*

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ABSTRACT

Piscirickettsia salmonis is a Gram-negative, intracellular fish bacterium responsible for piscirickettsiosis, the main systemic disease that causes significant economic losses in the Chilean salmon industry. This fastidious bacterium affects several salmonids species such as Rainbow trout (*Oncorhynchus mykiss*), Atlantic salmon (*Salmo salar*) and Coho salmon (*Oncorhynchus kisutch*). Thus, *P. salmonis* causes an aggressive systemic infection on multiple organs and tissues such as kidney, liver, spleen, brain, intestine, ovaries, and gills. However, there are not many studies concerning the salmonids defense mechanisms after an infection with *P. salmonis*. On the other hand, it has been reported that teleosts have IgT, which is a mucosal immunoglobulin that is over expressed after a parasitic infestation. However, the IgT expression after an infection with *P. salmonis* has not been evaluated. Thus, the aim of this study was to perform an analysis of the IgT expression in Rainbow trout after a *P. salmonis* challenge.

A total of 240 Rainbow trout (weight 70 ± 12 g) were used for the challenge. Two tanks (80 fish each one) were injected with *P. salmonis* (0.2 mL/fish). Additionally, a tank contained 80 fish were injected with PBS (used as control). Thus, specific primers for IgT gene were designed to evaluate changes in gene expression of several tissues as kidney, spleen and foregut at days 3, 7, 14, 21, 28, and 35 post-infection. Also, peptides of IgT were designed to generate anti-IgT monoclonal antibodies to evaluate the protein levels in different immune tissues and IgT in fish serum by western blot and indirect ELISA. Additionally, IgT were detected by immunohistochemistry.

As expected, the IgT gene expression and protein levels were enhanced in intestine and serum of the infected fish at 21, 28 and 35 days post-infection. Additionally, IgT protein was increased in fish serum after 21 days post-infection. However, IgT was differentially expressed in head kidney, spleen and intestine as observed by western blot. These results demonstrated that IgT in increased in several fish immune organs after a bacterial infection. Other immune genes were evaluated and their response corroborated the infection. But, also was interesting to detect the change in the time of smelting. Thus, this immunoglobulin and several cytokines could by involve the acquired immune response in smolt Salmo salar and Rainbow trout against *P. salmonis.*
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KEYWORDS

Piscirickettsia salmonis, IgT, smolt, Rainbow trout, fish immune response
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