IMMUNE RESPONSE OF TILAPIA (OREOCHROMIS NILOTICUS), VACCINATED AND CHALLENGED WITH FRANCISELLA NOATUNENSIS ORIENTALIS, REGULATION OF IMMUNE-RELATED GENES EXPRESSION

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RESUMO

Immune response of tilapia (*Oreochromis niloticus*), vaccinated and challenged with *Francisella noatunensis orientalis,* regulation of immune-related genes expression **Bem-Hamed** Said [1*], **Tapia-Paniagua** Silvana[2], **Moriñigo** M Angel[2], **Tachibana** Leonardo[1], **Dias** Danielle de Carla[1], **Ranzani-Paiva** Maria Jose[1] [1] Fisheries Institute, Sao Paulo, Brazil, APTA/ SAA, Av. Conselheiro Rodrigues Alves, 1252 – Vila Mariana, São Paulo, Brazil. mranzanipaiva@gmail.com [2] University of Malaga, Spain * Bolsista FAPESP de Pós-Doutorado (Processo no.2016/19816-9) benhamed_med@yahoo.fr *Francisella noatunensis orientalis* (Fno), is a Gram-negative, facultative intracellular bacterial pathogen infecting both cultured and wild fish and causes heavy mortalities in farmed fishes. It was identified as the cause of francisellosis. Application of antibiotics and chemotherapeutic drugs to treat this disease has triggered an environmental contamination and disturbance affecting the consumer's health and the outbreak of pathogen resistant to antibiotic. In this study, we have evaluated the protective efficacies of inactivated vaccine and analyzed the regulation of genes expression related to immune response in tilapia. Three groups of tilapia (n=50) healthy and weighed 30 ± 3.0 g averagely were reared in a controlled Recirculating Aquaculture System. The fish were vaccinated with prime-injection; two weeks later, a booster-injection were performed with 0.1 mL of inactivated *Francisella noatunensis orientalis* at a concentration of 10^8 UFC mL^{-1}. Vaccinated fish were challenged with live bacteria (10^6 UFC mL^{-1}). A control group reared in the same conditions and injected with PBS were infected with the same concentration of live bacteria. Relative percentage of survival (RPS), for two weeks post vaccination (dpv), was evaluated after challenge with virulent Fno (10^6 UFC mL^{-1}). Spleen and liver of control and vaccinated tilapia was sampled after one, two and three weeks of the challenge day. Gene expression feature of GADPH, EF1α, Ilβ, TNFα, C8β, IgM and HSP70 was analyzed. Results shows that the RPS of vaccinated tilapia, three weeks post challenge reached 52%. Control fish (unvaccinated and challenged) presented several clinical signs essentially alterations in behavior, erratic swimming, skin hemorrhage. After dissection, the fish showed granule formation essentially in liver and spleen. For gene expression, in samples of fish spleen, we noted a significant down-regulation of the genes TNF and Ilβ. Considering the modulation of immune system related genes expression and the relative percentage of survival we could suggest that the prepared vaccine could be promising after optimization tests taking in account the aspect facultative intracellular of this pathogen. **Acknowledgments** Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP), São Paulo, Brasil, Processes number: 2016/19816-9, 2017/05183-7 and 2018/06012-4.

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