

INDUCTION OF CELL-MEDIATED IMMUNE RESPONSES AFTER VACCINATION WITH INACTIVATED OIL-EMULSION *NOCARDIA SERIOLAE* IN AMBERJACK *SERIOLA DUMERILI*

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Nocardia seriolae is a Gram-positive intracellular bacterium that causes Nocardiosis in cultured yellowtail *Seriola quinqueradiata* and amberjack *Seriola dumerili*, which results in serious economic losses in aquaculture production in Japan. Therefore, an effective vaccine is urgently needed. In mammals, cell-mediated immunity (CMI) plays crucial role in protection from intracellular pathogen infection. In the present study, induction of cell-mediated immune response was evaluated in amberjack injected with formalin-killed *N. seriolae* vaccine containing oil adjuvant. Fish were sensitized with *N. seriolae* FKC alone or oil-emulsion of FKC (O-FKC) at 10^8 CFU/fish by i.p. injection. After 8 months, fish were challenged by i.p. injection with 10^6 CFU/fish of live *N. seriolae*. Agglutination titer in FKC-vaccinated fish showed high values (2^5 to 2^7) whereas those in O-FKC injected fish were less than 2^3 at Day3 and Day7 post-challenge. In addition, gene expression level of *IFN γ* was up-regulated only in O-FKC injected fish at Day3 post-infection. Moreover, although Th2-skewing condition was confirmed in FKC-vaccinated fish, O-FKC vaccination induced predominance of Th1 but not Th2 based on gene expression analysis of *T-bet/Gata-3* at Day 7 post-challenge. Relative percent survivals of FKC- and O-FKC-vaccinated fish were 26.9% and 43.6%, respectively at Day 9. These results suggest that inactivated oil-emulsion *N. seriolae* vaccine exhibit CMI-inducing effect in fish.

KEYWORDS

Cell-mediated immunity, Vaccine, Intracellular pathogen, Oil adjuvant, Th1/Th2, IFN γ

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