Effect of incorporating different concentrations of palm oil as adjuvant in fish vaccine

ABSTRACT

Adjuvants play important role in vaccine efficacy due to the slow release that leads to prolong immune response. This study determines the advantage of palm oil as adjuvant in the newly developed feed-based killed vaccine against streptococcosis. One thousand two hundred red tilapia of approximately 100g bodyweight were divided into 3 major groups. Group 1 consisted of 500 fish and was further divided into 5 sub-groups with replicate. Group 2 consisted of 600 fish and was further divided into 6 sub-groups while Group 3 with 100 fish in replicate. Fish of Group 1 were vaccinated with the feed-based killed vaccine containing 0%, 3%, 5% and 7% Freund's incomplete adjuvant (FIA) at weeks 0, 2 and 6. Group 2 was similarly vaccinated with the vaccine containing palm oil adjuvant (POA) at concentrations of 0%, 3%, 5%, 7% & 10%. Group 3 was control without vaccination. On week 10, all fish were challenged intraperitoneally with 2.6 x 109 cfu/ ml of live Streptococcus agalactiae. Serum samples were collected at weekly intervals from all replicates and were subjected to ELISA to determine the systemic antibody responses. Immunization by both POA and FIA resulted in significant ($p<0.05$) increase in the serum antibody levels (IgM) as early as week 1, while the level in the control group remained insignificant ($p>0.05$). The 10% palm oil adjuvant (POA) stimulated the best systemic immune responses resulting in 70% survival rate after challenge.

Keyword: Optimal dosage; Adjuvants; Vaccines; Streptococcosis; Tilapia