Efficacy of an Inactivated Vaccine and Nutritional Additives Against White Spot Syndrome Virus (WSSV) in Shrimp (Penaeus monodon)

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Abstract

Although the immune system of shrimps is not comparable to that of vertebrates, shrimps can acquire protection against pathogenic challenge by building up immunity. In this study, formalin-inactivated virus (FIV) was administered by injection, bath-immersion, or orally to determine levels of vaccination-mediated protection against the pathogenic white spot syndrome virus (WSSV). Diets supplemented with alfalfa, methyl sulfonyl methane (MSM), or wheat grass were provided with or without FIV. Shrimp injected with FIV and challenged 3, 15, or 30 days after vaccination had cumulative and relative survivals of 83%, 67%, and 33%, respectively. Survival of shrimp challenged by bath-immersion 3-45 days after vaccination by immersion was significantly higher than in the unvaccinated control. Orally vaccinated shrimp challenged by bath-immersion were partially protected up to 45 days after vaccination (cumulative survival 63.7%, relative 61.7%) but not til 60 days after vaccination (cumulative 8%, relative 3.2%). Survival of unvaccinated shrimp challenged by bath-immersion improved when shrimp were fed a diet supplemented with wheat grass or MSM, but not alfalfa. Survival was further enhanced when FIV was provided together with diets supplemented with wheat grass (cumulative 72.7%, relative 94.8%) or MSM (cumulative 73.3%, relative 96.3%).

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