The Asian Journal of Animal Science (December, 2010), Vol. 5 Issue 2 : 164-167 | RESEARCH ARTICLE

Chitosan and levamisole induced survival and bacterial disease resistance in tiger shrimp, *Penaeus monodon* (Fabricus)

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ABSTRACT

The immunomodulating effects of a number of compounds including chitosan, and levamisole are reported. This study is intended to determine the efficacy of immunosimulants such as levamisole and chitosan in juvenile *Penaeus monodon* disease management. The study also evaluated the effective dose of immunostimulats in relation to growth and disease management. The dose 50 mg /kg levamisole (Feed C) and 50 mg /kg chitosan (Feed D) produced high AGR and SGR than other doses tested. The same doses administration gave more protection against bacterial challenge at the rate of 60% more than the control.

Key words : Shellfish, Disease management, Immunostimulants, Chitosan, Levamisole

The expression of disease is the result of a complex interaction between agent, host and the environment, although the close contact between animals in most aquaculture systems allows pathogens less time in the inhospitable marine/ aquatic environment. The pathogenic stress also leads to the inhibition of growth and survival. Major problem in the control of bacterial disease is that bacteria, which are normally associated with a hatchery, may at certain times become the principal cause of mortality (Vadstein *et al.,*1993; Misciattelli *et al.,* 1998). *Vibriosis* is considered as one of the major causative agents among the bacterial pathogens reported in shrimp aquaculture resulting in high mortalities and severe economic losses (Lightner, 1988; Ruangpan and Kitao,1991; Goarant *et al.,* 1998; Rodgers and Furones. 1998). Vibriosis affects all life stages of the animals from larva to broodstock. However, it is important to realize that the presence of a potential pathogen is not equivalent to the presence of disease.

The prevention and control of diseases are now considered as the priority subjects for research and development activities in shrimp aquaculture. The developments and sustainability of this industry are very much at stake as shrimp aquaculture faces significant increase in the ecological and pathological problems on a global scale (Bachere, 2000). Immunostimulants are valuable tools for the control of diseases and may be useful in shrimp culture (Huxley, 2002; Huxley and Lipton, 2009). The immunomodulatory effects of glucan, chitin, lactoferrin, levamisole and b-glucan for shrimp have been reported (Sung *et al*., 1996; Selvin *et al.,* 2004).

In this context, new efforts has been taken to determine the effective dose of immunostimulants such as levamisole and chitosan in terms of growth and disease resistance ability. This study also leads, to develop a package of management strategy in potential cultured tiger shrimp.

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MATERIALS AND METHODS

Collection of experimental animal:

The tiger shrimp, *Penaeus monodon* was collected from extensive farm near Rajakamagalm area, Kanyakumari district, Tamilnadu. The collected shrimps were acclimated to laboratory conditions in one tonne fibre reinforced plastic (FRP) tanks. The tank was filled with seawater and maintained with adequate aeration and optimum water quality (salinity = 35±2 $^{o}/_{oo}$; temperature = 28±2^{0}C). The shrimps were fed with pelleted feed (CP Nova, Kochi).

Preparation of immunostimulated feed:

For immunostimulation of *P. monodon,* two immunostimulants *viz.,* Levamisole and Chitosan were used at different doses. The methodology of preparation of the feed and its incorporation are described below:

Levamisole feed:

Levamisole @300 mg/kg shrimp body wt (as Feed