EFFECTS OF DIFFERENT LEVELS OF *Pinus tabulaeformis* POLLEN ON GROWTH AND STRESS RESISTANCE OF MILKFISH FRY *(Chanos chanos)*

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ABSTRACT

The present study investigated the effects of different inclusion levels of pine pollen from *Pinus tabulaeformis* Carr. on the growth performance and stress resistance of milkfish fry (*Chanos chanos*). Milkfish fry with average body weight of 0.02 g were stocked in 15 tanks (40 fish per tank). A control diet (without pine pollen) and four experimental diets were prepared containing different levels of pine pollen at 0 g kg^{-1}, 1.3 g kg^{-1}, 2.6 g kg^{-1}, 3.8 g kg^{-1}, and 5.1 g kg^{-1} was fed to the experimental fish for 60 days. At the termination of the experiment, milkfish were subjected to acute ammonia and high salinity shock test. The result of feeding trial revealed that milkfish fed diets containing different levels of pine pollen showed significantly higher growth ($p < 0.05$) in terms of weight gain, specific growth rate, feed conversion ratio, and protein efficiency ratio than the control diet. Survival of the milkfish during the trial were not significantly different among treatments ($p > 0.05$). Survival rates of milkfish groups exposed to high salinity shock test for 72 h were not significantly different from each other ($p > 0.05$). In contrast, results of the ammonia stress test revealed that the survival rates of milkfish fed with the diets containing (2.6 to 5.1 g kg^{-1}) were significantly higher ($p < 0.05$) than those fed with diets containing 1.3 g kg^{-1} and the control diet. Optimum dietary PP level was estimated using the quadratic model by using SGR and FCR values and found to be is 2.9 g kg^{-1} and 3.0 g kg^{-1}, *respectively. In conclusion, pine pollen can be used as a supplement in milkfish* diet to enhance growth and stress resistance against environmental stressors like ammonia.

Keywords: Pine pollen, *Chanos chanos*, phytandrogens, immunostimulant, ammonia, salinity