

Kittima Vanichkul 2010: Roles of Turmeric (*Curcuma longa* Linn.) and Creat (*Andrographis paniculata* Wall. Ex Nees) Extract on Immunity of Aquatic Animals and Their Activities on the Control of Pathogenic Bacteria. Doctor of Philosophy (Aquaculture), Major Field: Aquaculture, Department of Aquaculture. Thesis Advisor: Associate Professor Nontawith Areechon, Ph.D. 174 pages.

The study on roles of turmeric (*Curcuma longa* Linn.) and creat (*Andrographis paniculata* Wall. Ex Nees) extract on the control of pathogenic bacteria in aquaculture was conducted. The results showed Minimal Inhibitory Concentration (MIC) and Minimal Bactericidal Concentration (MBC) values of turmeric extract with *Vibrio harveyi* at 512 and 2,275.55 ppm and *Streptococcus agalactiae* at 853.33 and > 4,452.17 ppm respectively. Creat extract showed MIC and MBC values with *Vibrio harveyi* at 2,560 and 2,560 ppm and *S. agalactiae* at 853.33 and > 4,452.17 ppm respectively. Black tiger shrimp (*Penaeus monodon* Fabricius) and Pacific white shrimp (*Litopenaeus vannamei* Boone) fed with turmeric extract at 25.0 ppm for 2 weeks had significantly better resistance against pathogenic *V. harveyi* when compared with control ($P < 0.05$). Study on immune functions revealed that both marine shrimps fed with turmeric extract had significantly higher phenoloxidase and bactericidal activity than the control. Nile tilapia (*Oreochromis niloticus* Linn.) fed with turmeric extract 20.0 ppm for 2 weeks had significantly better resistance against pathogenic *S. agalactiae* than the control ($P < 0.05$). Phagocytic and respiratory burst activity of tilapia were significantly higher than control after feeding with 20.0 ppm turmeric extract for 15 and 30 days. Similar results were found with creat extract experiment with shrimp immunity. After feeding with creat extract at 30.0 ppm for 2 weeks, both marine shrimps had better resistance against *V. harveyi* than control ($P < 0.05$). Phenoloxidase, phagocytic activity and bactericidal activity of treated shrimp were significantly higher ($P < 0.05$). Creat extract did not have any impact on resistance against *S. agalactiae* in Nile tilapia. However, phagocytic activity of tilapia fed with 10 ppm creat extract for 15 days was significantly higher than control. Study on total bacterial count in shrimp and tilapia intestine indicated the significantly lower number of bacteria and *Vibrio* spp. in all turmeric and creat extract-treated shrimp and fish when compared with the control.

The results from this study suggest that the turmeric and creat extract can effectively enhance the resistance against pathogenic bacteria of marine shrimp and Nile tilapia. These herb extracts can also enhance some immune functions and can effectively control the intestinal bacteria of these cultured aquatic animals.

Student's signature

Thesis Advisor's signature