Effects of a Probiotic and Herbal Supplemented Diet on Growth, Blood Biochemistry, and Innate Immune Response of Olive Flounder and Parrot Fish

Man-Chul Kim†, Ramasamy Harikrishnan†, Moon-Soo Heo*

Marine Applied Microbes and Aquatic Organism Disease Control Lab, Aquatic Biomedical Sciences, School of Marine Biomedical Sciences, College of Ocean Science & Marine and Environmental Research Institute, Jeju National University, Jeju 690 756, South Korea

(Received 28.3.11, Accepted 1.6.11)

Key words: Oplegnathus fasciatus, Paralichthys olivaceus, probiotics, herbal medicine, innate immune response

Abstract

Olive flounder (Paralichthys olivaceus) and parrot fish (Oplegnathus fasciatus) were challenged with the pathogenic Edwardsiella tarda, then fed an unsupplemented control diet or a diet containing probiotics and herbal extracts for 12 weeks. The effects of supplementation on blood biochemistry, innate immune response, and disease resistance were determined at weeks 1, 2, 4, 6, 8, 10, and 12 post-challenge. Final weights were significantly higher in fish fed the supplemented diet. Activity of serum glutamic pyruvic transaminase (SGPT) and serum glucose (GLU) were significantly higher in fish fed the supplemented diet throughout the trial. Values were significantly higher in fish fed the supplemented diet for serum glutamic oxaloacetic transaminase (SGOT) from week 6 to 12 and total protein in weeks 10-12. Respiratory burst activity and serum lysozyme activity were significantly higher in fish fed the supplemented diet in 4-12. Cumulative mortality in fish fed the supplemented diet was 10% for olive flounder and 5% for parrot fish, while for olive flounder and parrot fish fed the unsupplemented control, mortality averaged 50% and 45%, respectively. Results suggest that diets containing probiotics and herbal extracts enhance growth, blood constituents, and innate immunity in both olive flounder and parrot fish.