

Effects of partial substitute of fish meal with *Gracilaria pygmaea* on growth performance and physiological responses of barramundi juveniles (*Lates calcarifer*)

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Abstract

A 40-day experiment was carried out to investigate the effects of replacement of fish meal with *Gracilaria pygmaea* on the growth and feeding performance, hemato-immunological parameters and digestive enzymes of Asian sea bass *Lates calcarifer* with initial weight 28 ± 5.9 g using a complete random design with 5 treatments and 3 triplicates. The experimental diets were prepared using a fishmeal based positive control diet and a fishmeal-soy protein negative control diet supplemented with 3, 6 and 9% red algae. Results of the experiment indicated that growth and feeding performance including specific growth rate, feed conversion and protein efficiency ratios as well as feed intake in all treatments were not significantly different ($P > 0.05$). Crude Protein, lipid, moisture and ash contents of carcass were not markedly altered in all dietary treatments. Serum lysozyme and alternative complement activities as well as serum immunoglobulin and total protein content significantly decreased in fish fed by 9% macroalgae inclusion ($P > 0.05$). Among the serum chemical parameters of Asian sea bass, glucose, total protein and albumin were not significantly affected by various dietary treatments ($P > 0.05$). Increasing dietary supplementation of *G. pygmaea* decreased the serum triglycerides and cholesterol in compared to the NC. *Gracilaria* inclusion levels did not affect intestinal total protease and amylase activities ($P < 0.05$); however, intestine lipase activity in fish fed GL6 diets was significantly higher than other groups ($P < 0.05$). The results of the present study recommend the inclusion of *Gracilaria* meal up to 3 %, without significant negative effects on the growth performance, body composition and health parameters of *Lates calcarifer*.



Keywords: Barramundi, Dietary macroalgae, Fish meal replacement, immunological response

