

Wannapa Rangsin 2012: Digestive Enzyme Activities, Apparent Digestibility Coefficient and Effect of Enzyme Supplement on Feed Utilization in Striped Catfish, *Pangasianodon hypophthalmus* Sauvage, 1878. Doctor of Philosophy (Aquaculture), Major Field: Aquaculture, Department of Aquaculture. Thesis Advisor: Associate Professor Nontawith Areechon, Ph.D. 125 pages.

Activity of digestive enzymes, protease, amylase and lipase, in different stages of striped catfish, *Pangasianodon hypophthalmus* Sauvage, 1878 was investigated. For the larval stage, activity of acid protease and lipase was detected at hatching while amylase and alkaline protease were detected at 1 and 3 days after hatching (DAH), respectively. Development pattern of these enzymes in the larval stage were similar in which the activity were fluctuated during the first two weeks and then steadily increased onwards. Protease, amylase and lipase activity in stomach, anterior intestine, posterior intestine and liver of 30 g striped catfish were significantly higher than 10 g fish ($P < 0.05$). The highest activity of protease, amylase and lipase of 10 g striped catfish were detected at pH 3, 7 and 9, respectively and pH 3, 7 and 12, respectively for the 30 g fish. Apparent digestibility coefficient in different protein sources revealed the better digestion of fish meal in 30 g fish than the 10 g fish ($P < 0.05$). While there were no significant differences of digestibility coefficient of plant protein sources including soybean, canola, sunflower meal and distillers dried grains with soluble (DDGS) between the two sizes of fish ($P > 0.05$). Replacement of fish meal by soybean meal at 0, 50, 75 and 100% with supplementation of protease from *Bacillus* sp. was studied in 20 g striped catfish. After 12 weeks of feeding trial, it was found that supplementation of bacterial protease in normal feed or replacement feed did not cause any significant differences of growth performances, feed utilization and protease activity ($P > 0.05$). Replacement of fishmeal with soybean meal at 0 and 50% did not cause any significant impact on growth, feed utilization and protease activity ($P > 0.05$) while 75 and 100% replacement caused negative impact on these values when compared with the control ($P < 0.05$). This result indicated the possibility to formulate the cost effective diet for 20 g striped catfish by replacing fishmeal at 50% with soybean meal without any negative impact on growth rate.

Student's signature

Thesis Advisor's signature