Dietary supplement of Enterococcus faecalis on digestive enzyme activities, short-chain fatty acid production, immune system response and disease resistance of Javanese carp (Puntius gonionotus, Bleeker 1850)

ABSTRACT

This study investigated the effects of Enterococcus faecalis on digestive enzyme activities and short-chain fatty acid production in fish intestine, resistance against Aeromonas hydrophila and humoral immunity response by 3 experiments on Javanese carp (Puntius gonionotus). The experiment 1 revealed that diet supplemented with E. faecalis significantly (P < 0.05) increased protease and lipase activities compared to control fed fish. Moreover, E. faecalis supplementation significantly enhanced the production of propionic and butyric acid in the intestine, while no significant difference (P > 0.05) in acetic acid production was observed. In the challenge study (experiment 2), fish were injected (intraperitoneal) with 10^7 A. hydrophila per ml and survival was significantly improved when fish were fed diet supplemented with E. faecalis compared to control fish. In experiment 3, dietary E. faecalis affected immune system response as fish fed the probiont and exposed to 10^6 A. hydrophila per ml displayed significantly elevated antibody levels compared to control fed fish. Fish fed diet supplemented with E. faecalis but not exposed to the pathogen revealed significantly higher antibody level than control fish (P < 0.05). Therefore, E. faecalis can be used as a probiotic in Javanese carp farming.

Keyword: Challenge; Digestive enzyme; Enterococcus faecalis; Immune system; Probiotic; Short-chain fatty acid