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Effect of dietary prebiotics and probiotics on snakehead (*Channa striata*) health: Haematology and disease resistance parameters against *Aeromonas hydrophila*

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Abstract: This study examined the effect of dietary prebiotics and probiotics after 16 weeks, followed by 8 weeks of post feeding trial with the control unsupplemented diet on haematological and immune response against *Aeromonas hydrophila* infection in *Channa striata* fingerlings. Fish were raised on a 40% protein and 12% lipid feed containing three commercial prebiotics (β -glucan, GOS or galacto-oligosaccharide, MOS or mannan-oligosaccharide); and two probiotics- (*Saccharomyces cerevisiae*, *Lactobacillus acidophilus*), respectively and a control. Throughout the study, supplementation with dietary prebiotics and probiotics led to significant ($P<0.05$) improvement in the red blood cells, white blood cells, packed cell volume, haemoglobin concentration and serum protein level and lysozyme activities; and these improvements were effective significantly ($P<0.05$) when the fish were challenged with *Aeromonas hydrophila* at the dose of 2×10^6 . The disease resistance against *A.hydrophila* was higher significantly ($P<0.05$) in fish fed with probiotic feed supplements (*L.acidophilus* was highest) compared to prebiotics and control. The study is the first to report the absence of differences in sustaining the efficacies attained after intake of β -glucan, GOS and MOS upon post-feeding with an unsupplemented feed, over a prolonged period.

1.0 Introduction: The increasing intensification and commercialization of aquaculture systems has accelerated the outbreak of diseases that are responsible for huge fish losses (Bondad-Reantaso *et al.*, 2005). Intensified aquaculture of the Asian snakehead, *Channa striata* (Bloch, 1793) is faced with similar problems associated with the deterioration of water quality and diseases outbreak (Dina, 2013; FAO, 2012; Sinh and Pomeroy, 2010). The bottom-living habitat of snakehead exacerbates the situation since the bottom region boggy water (Sahoo *et al.*, 2012) zone carries 10-20 time higher bacterial population compared to the other water column (Lewis and Bender, 1961).

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