Effects of pretreatment with microbial phytase on phosphorous utilization and growth performance of Nile tilapia (*Oreochromis niloticus*)

L. Cao  
College of Fishery, Key Lab of Agricultural Animal Genetics, Breeding & Reproduction of Ministry of Education, Huazhong Agricultural University, Wuhan, Hubei, China & Aquaculture & Aquatic Resources Management, School of Environment, Resources & Development, Asian Institute of Technology, Pathum Thani, Thailand

W.M. Wang  
College of Aqua-Life Science & Technology, Shanghai Fisheries University, Shanghai, China & Aquaculture & Aquatic Resources Management, School of Environment, Resources and Development, Asian Institute of Technology, Pathum Thani, Thailand

A. Yakupitiyage and D.R. Yuan  
Aquaculture & Aquatic Resources Management, School of Environment, Resources & Development, Asian Institute of Technology, Pathum Thani, Thailand

J.S. Diana  
School of Natural Resources & Environment, University of Michigan, Ann Arbor, MI, USA

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This study was to assess effects of the pretreatment in all plant based diets with microbial phytase on phosphorous utilization and growth performance of Nile tilapia (*Oreochromis niloticus*). Pretreatment trials were conducted using phytase at graded doses to determine the optimal dose of phytase. Available phosphorus (P) levels increased significantly with the increased doses of phytase and the dose of 1000 U kg\(^{-1}\) was most efficient. Based on the pretreatment trials, plant based diets for Nile tilapia were formulated by pretreating with phytase at 1000 U kg\(^{-1}\). Experimental diets were supplemented with graded levels of monocalcium phosphate (MCP) at 25, 18.75, 12.5, 6.25 and 0 g kg\(^{-1}\) diet. In addition, there were three controls: one phytase control, one inorganic P control and one pretreatment control.
The results showed that diets pretreated with phytase gave better growth performance, feed conversion ratio and protein efficiency ratio of Nile tilapia compared with the phytase control diet and pretreatment control diet (P < 0.05). There were no significant differences in growth performance of Nile tilapia between the inorganic control diet and phytase pretreated diets supplemented with MCP at 25, 18.75 and 12.5 g kg⁻¹ (P > 0.05), which resulted in significantly better performance than those at 6.25 and 0 g kg⁻¹ (P < 0.05). Dietary interaction effects of phytase were observed for phosphorus retention efficiency and phosphorus load. Apparent digestibility coefficient of P (ADCp) was improved significantly by phytase pretreatment (P < 0.05). No significant difference was detected on ADC of crude protein among all experimental diets (P > 0.05).

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