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Modulation of digestive enzymes, GH, IGF-1 and IGF-2 genes in the teleost, Tilapia (*Oreochromis mossambicus*) by dietary curcumin

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Abstract Aquaculture is faced with the challenges of the use of synthetic compounds as growth enhancers and the presence of several contaminants in water. These factors severely deteriorate the quality and quantity of aquaculture products. Phytochemicals play a major role by working as antioxidant agents of which curcumin has become the gold standard. Curcumin, from *Curcuma longa* shows a wide spectrum of biological activities which include anticancerous, antioxidant, anti-inflammatory, antibacterial, antiviral, anti-fungal, antidiabetic, antistress, hepatoprotective and gastroprotective effects. Curcumin in 0.5 and 1 % doses were given as feed additive to *Oreochromis mossambicus* for 35 days. After feeding trial, activities of digestive enzymes such as α-amylase, protease and lipase were analysed. There was a significant increase in the activities of α-amylase, protease and lipase with 0.5 and 1 % curcumin supplementation in feed. Real-time quantification of GH in brain, and IGF-1 and IGF-2 genes in muscle revealed that curcumin significantly increased the expression of these genes. This is the first study to report that curcumin supplementation at concentrations of 0.5 and 1 % in the feed improved the activities of digestive enzymes and also modulates the expression of GH in brain and growth factors such as IGF-1 and IGF-2 in muscle of *O. mossambicus*.

Keywords Digestive enzymes · Growth hormone · Insulin-like growth factor-1 · Insulin-like growth factor-2 · *Oreochromis mossambicus*

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