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Differential Treatment of Non-Toxic *Jatropha curcas* L. and its Impact on Growth Performance and Whole Body Mineral Absorption of Common Carp, *Cyprinus carpio* L.

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Abstract

Jatropha curcas L. is a drought resistant tree widespread throughout the tropics and subtropics with seeds rich in oil and protein. This plant has significant economic importance because of its agro-industrial and medicinal uses. This study was conducted to evaluate the suitability of non-toxic *J. curcas* as an alternative protein source for common carp, *Cyprinus carpio* L. Four experimental diets were formulated to contain defatted and heat treated non-toxic *J. curcas* at 50% of total dietary protein (Diets Jat, J-Eth, J-Lys, J-Phy, respectively) with one further diet acting as a control (Diet Con) which included only fish meal and wheat meal as protein sources. The defatted and heat treated jatropha in the experimental diets was either extracted further with 80% ethanol (Diet J-Eth), supplemented with 1% L-Lysine (Diet J-Lys) or had 500 FTU phytase added (Diet J-Phy). All the diets were isonitrogenous (37% crude protein) and isoenergetic (19.5 kJ g⁻¹). A 52 day feeding trial was carried out on two replicate groups of six fish (initial weight ca. 6g) per treatment. Fish were given seven times maintenance at 25°C. The addition of L-lysine or phytase raised the percentage body weight gain to levels comparable to the control whereas fish fed Jat or J-Eth showed significantly lower performance. There were no significant differences in feed intake, food conversion efficiency, protein efficiency ratio, protein productive value and energy retention among the fish receiving the experimental diets. Generally, all the diets containing jatropha decreased body moisture content and raised lipid with the highest value recorded in the J-Eth group. Ash was significantly lower in Diet J-Eth when compared to the control. Whole body P and Mg were significantly higher in J-Phy comparable to control, whereas, K and Ca were significantly lower only in group J-Lys. There were no significant differences in Mn, Fe and Na among the groups, but the level of these minerals was slightly higher in group J-Phy, which thus came closer to the control than the other experimental groups. This study shows that non-toxic jatropha is a very promising source of cheap plant protein for common carp when properly treated before diet formulation.

Keywords: Common carp, non-toxic *Jatropha curcas*, protein source