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“Development on the margin”

Nutritional and Physiological Evaluations of the Dietary Inclusion of *Jatropha Platyphylla* Kernel Meal in Nile Tilapia (*Oreochromis Niloticus* L.) Diet

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Abstract

The seeds of *Jatropha platyphylla*, available on the pacific coast from Sinaloa to Michoacán including the Nayarit and Jalisco states in Mexico, are consumed by local communities after roasting them in a manner similar to that used for peanuts. The kernels and kernel meal of *J. platyphylla* were found to be free of phorbol esters but the kernel meal contained the antinutritional factors, trypsin inhibitor, lectins and phytate at levels similar to those in *J. curcas* kernel meal. However, trypsin inhibitor and lectins are heat labile so this explains why the local people can eat roasted seeds without ill effect. The fatty acid profile of the *J. platyphylla* oil was similar to that of *J. curcas* and the kernels of both these species contained ca 58 % oil. The crude protein content of *J. platyphylla* kernel meal was 75 % against 60 % in *J. curcas*, and the amino acid compositions were similar. All the essential amino acids, except lysine, were more abundant than in soybean meal or the FAO Reference protein. Tilapia and other fish species have been found to be particularly sensitive to *Jatropha* toxins. For this reason they are useful subjects for bioassays. The heated *J. platyphylla* kernel meal was included in a standard diet (crude protein 36 %) for Nile tilapia to replace 50 % of the fish meal protein. The fish grew as well as those on a control diet in which none of the fish meal was replaced and those on a diet in which 50 % of the fish meal protein was replaced by soybean meal. In all the three groups, blood biochemical parameters that serve as biomarkers for toxicity were within the normal ranges. This study confirmed the non-toxic nature of *J. platyphylla*. The kernels and kernel meal of this species could help alleviate protein and energy deficiency in malnourished children in the lower mountain skirts of pacific coastal areas of Mexico. It could also be used to produce new cultivars with desirable traits using conventional inter species cross breeding and molecular breeding techniques.

Keywords: Antinutritional factors, *jatropha platyphylla* kernel meal