

Effect of dietary *Acrocomia aculeata* rich medium chain fatty acids kernel oil on Type 2 diabetic animal model

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The macauba palm (*Acrocomia aculeata*) is native of tropical America and it is well spread in the Central area in Brazil. It produces similar oil yields of the palm oil. Besides the oil from the pulp, which is rich in oleic acid, macauba provides kernel oil that encompasses mainly medium chain fatty acids (MCFAs), mostly lauric acid. It has been claimed that due to the catabolic pathway of the MCFAs it can be used as an alternative source of energy to replace partially that comes from carbohydrate and, therefore, diminish the hazardous effects of type 2 diabetes.

In this study, rats induced to diabetes by high fat diet and low dose of streptozotocin were fed with partial replacement of energy by *Acrocomia aculeata* kernel oil (AKO). The oil was obtained by cold pressing and contained 45.40% of lauric acid. Two doses of AKO were evaluated: 40 and 160 g.kg⁻¹ diet. Blood glucose level, fatty acid deposit in the epididymal adipose tissue, lipid profile, insulin secretion, and insulin sensitivity were assayed after 28 days.

Dietary with AKO reduced hyperglycemia, did not result in higher accumulation of MCFAs in the epididymal adipose tissue, ameliorated insulin secretion, lowered insulin resistance as shown by the models HOMA-IR and HOMA- β , augmented pancreatic beta cells functional capacity. Moreover, morphometric analysis demonstrated that AKO restored the number pancreatic β -cell in the diabetic rats and increased in the non-diabetic rats fed diet with AKO. In addition, AKO decreased significantly triglyceride and low density lipoprotein-cholesterol, while high-density lipoprotein-cholesterol levels were increased. Those results suggested that the partial replacement of carbohydrate energy for AKO can be very beneficial in the control of type 2 diabetes.

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