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# Hypoglycemic and Hypolipidemic Effects of the Methanolic Extract of *Costus speciosus* (Koen) Sm., Leaf Extract in Alloxan-Induced Diabetic Rats

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In Sri Lanka, the leaves of *Costus speciosus* ("Thebu" in Sinhala), are consumed in the belief that it has antidiabetic properties. While the hypoglycemic and antilipidemic activities of sesquiterpene lactones isolated from the rhizome of *C. speciosus* has been reported, there have been no studies reported so far on the biological activity of the leaves. The present study was conducted to investigate the hypoglycemic and hypolipidemic effects of the leaves of *C. speciosus* in both normal and alloxan induced diabetic rat model, in view of its ethnomedical usage. Male Wistar rats (8-10 weeks, 180-210 g) were used. Test and control groups had 6 rats per group. Standard t-test was used to determine statistical significance. The 80% aqueous methanolic extract of the leaves was used for all tests.

A glucose tolerance test with normal rats indicated that peak levels of blood glucose were reached in 90 minutes after the glucose load. A dose response study (5,10, 20, 30 and 40 mg per kg body weight) with normal rats indicated that 20 mg/kg bw was the optimum dose to be used, with a 60% reduction of blood glucose compared with control (solvent used – 20% aqueous ethanol). It is noteworthy that the test group recorded a significantly ($p < 0.05$) lower blood glucose level at $t = 90$ min than at $t = 0$ min indicating that the 80% aqueous methanol extract exerted an overall hypoglycemic effect with normal rats at 90 min despite being challenged with glucose load. The same dose showed an improvement in the glucose tolerance of alloxan-induced diabetic rats, reducing the blood glucose at 90 min by 60% compared with control. These effects were found to be comparable with the effect of the synthetic drug glipizide at a dose of 10 mg/kg.

In alloxan-induced diabetic rats, long term administration of the 80% methanolic extract of *C. speciosus* leaves daily for 6 weeks resulted in a significant lowering of fasting and postprandial serum glucose (64% and 67% respectively) when compared to diabetic control rats. In addition, while diabetic rats displayed hypercholesterolaemia and hypertriglyceridaemia at the end of the 6 week period, the group treated with plant extract displayed significantly ($p<0.05$) decreased serum cholesterol and triglyceride levels and increased level of serum HDL-cholesterol when compared with control. Studies on the phytochemistry and activity-guided fractionation of the 80% methanolic extract of the leaves of *C. speciosus* are in progress.