

Anti-diabetic properties and nutrigenomic basis of *Curculigo latifolia*

ABSTRACT

Curculigo latifolia (*C. latifolia*) plant grows wildly in tropical Asia especially in Malaysia. *C. latifolia* fruit has 9000 times the sweetness of sucrose and it is due to a protein known as curculin. This indicates that *C. latifolia* plants has the potential to be used as an alternative low-calorie sweetener for diabetic patients. In the present study, anti-diabetic properties of *C. latifolia* fruit:root and the pertinent mechanism were investigated on diabetic-induced rats. Diabetes rats were developed by feeding high fat diet (HFD) which contain 56.9% calorie contributed by fat and low dose STZ (40 mg/kg bw) injection. Rats were administered with *C. latifolia* fruit:root at graded oral doses 50, 100 and 200 mg/kg b.w for 30 days. Before and after treatments, blood glucose, plasma lipid and adiponectin were measured to evaluate its anti-diabetic effects. The regulatory effects of *C. latifolia* fruit:root extracts on genes involved in glucose and lipid metabolisms were further studied on glucose transporter (GLUT 4), peroxisome proliferator-activated receptor (PPAR γ) and adiponectin receptor (AdipoR1) in skeletal muscle tissue. The *C. latifolia* fruit:root possessed anti-diabetic activities as shown by the decreased of blood glucose, total cholesterol (TC), triglyceride (TG) and low density lipoprotein-cholesterol (LDL), as well as increased plasma level of adiponectin. Treatment with 200 mg/kg b.w of *C. latifolia* fruit:root extracts significantly improved glucose metabolism in diabetic-induced rats compared to other concentrations by increased gene expression of GLUT 4 (3 fold) and PPAR γ (4 fold) tissue in. Furthermore, adipose it also improved lipid metabolism by increased the expression of AdipoR2 (3 fold). Based on the current findings, *C. latifolia* fruit:root extracts exhibit anti-diabetic properties on hyperglycemia and hyperlipidemia in diabetic rats possibly through regulating the levels of GLUT4, PPAR γ and AdipoR2 tissue. Findings also provide an opportunity to food industries in designing product for diabetic complications.

Keyword: *Curculigo latifolia*; Diabetes; Gene expression; High fat fed diet; Streptozotocin