AI 03 Effect of methanolic extract of *Costus speciosus* (Thebu) leaf on insulin resistance in Wistar rats: Comparison with pioglitazone

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Costus speciosus (CS) is a widely used medicinal plant in Ayurveda and studies have been conducted to evaluate medicinal properties and chemical components of different parts. It has been found that ethanolic extract of CS rhizome possesses dose dependant antihyperglycemic, antihyperlipedemic and antioxidative effects in alloxan induced diabetic rats. The aim of this study was to compare the action of methanolic extract of CS leaf with pioglitazone in insulin resistant (IR) among male Wistar rats (170-250g). There were four groups (n=6x4). Group 1 remained as the normal control and the IR was induced to other groups by feeding a high fat diet (containing 19.13% fat) for 3 months. Rats were treated daily with the extract: Group 1: 500 mg/kg/d CS extract in carboxy methyl cellulose (CMC), Group 2: 1ml 0.5% CMC, Group 3: 500 mg/kg/d CS extract in CMC, Group 4: pioglitazone 10mg/kg/d in CMC for one month. Blood was drawn at baseline and after one month of treatment. Serum was analysed for concentrations of glucose, triglycerides and insulin. IR was calculated by three indices HOMA, QUICKI and McAuley. No significant differences were observed in the concentrations of glucose (5.48±1.87mmol/L vs. 6.05±0.28mmol/L, $p>0.05$) and triglycerides (1.33±0.41mmol/L vs. 1.6±0.37mmol/L, $p>0.05$) in normal rats treated with 500mg/kg of CS extract. CS extract significantly reduced serum insulin concentration in both normal (37.2%, $p< 0.05$) and IR rats (71.9%, $p<0.01$) while pioglitazone reduced it by only 29.6%. CS extract effectively reduced IR indexes HOMA by 61.3%, QUICKI by 15.6% and McA by 39.8% in IR rats and the reductions were only 41.9%, 6.5% and 6.6% respectively in normal rats. Further pioglitazone treatment reduced by 32.4%, 12.5% and 10% respectively. Methanolic extract of CS leaf possesses hypotriglyceridemic and hypoinsulinemic effect in Wistar rats. It is more effective than pioglitazone in controlling insulin resistance.

Keywords: *Costus speciosus,* insulin resistance, Wistar rats