Experimental evidences of methanolic extraction of *Cressa cretica* Linn. on alloxan induced hyperglycemic Wistar rats

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Received 12 January 2016; received in revised form 6 April 2016; accepted 6 April 2016  
Available online 24 April 2016

**KEYWORDS**  
*Cressa cretica* Linn.;  
Acute toxicity;  
In vivo anti-oxidant activity;  
Alloxan diabetes;  
Serum lipid profile;  
Serum biomarker enzymes

**Summary**  
In the present study, the physico-metabolic parameters measured were: serum insulin, serum lipid profile, serum biomarker enzymes and anti-oxidant enzymes, total cholesterol, HDL cholesterol, triglycerides, LDL cholesterol, VLDL cholesterol, total proteins, alanine transaminase (ALT), aspartate transaminase (AST), creatinine, insulin assay (RIA), for in vivo anti-oxidant activity of MECC was measured in liver tissue homogenate (LTH) by malondialdehyde (MDA), glutathione (GSH), superoxide dismutase (SOD) enzymes and histopathological examination of pancreas were also observed. Previously, the methanolic extract of *Cressa cretica* Linn. effect on alloxan induced hyperglycemic Wistar rats was proved by taking the parameters like body weight, blood glucose, glycogen content in liver and muscle. Oral administration of MECC (200 mg/kg, 400 mg/kg) for 28 days exhibited a significant reduction in blood glucose, serum ALT, AST, CR, lipids profile and hepatic MDA levels. The improvement of hepatic enzymes such as GSH, serum TP, HDL, insulin levels were also observed. The results of this work also suggest that MECC may possess anti-hyperglycemic and anti-oxidant property.

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**Introduction**

Chronic metabolic disorder named Diabetes mellitus II is characterized by high blood glucose levels due to absolute deficiency of circulating insulin levels (Venkatesh et al., 2003). This disease affects more than 15 million people showing complications that include hypertension,
atherosclerosis and microcirculatory disorders (Vivek et al., 2010). Cressa cretica Linn. (Convolvulaceae), used in diabetes and many other diseases (Vaidyaratnam, 1997). Presently, the effect of Cressa cretica Linn. methanolic extract on alloxan induced hyperglycemic Wistar rats was undertaken.

Materials and methods

Cressa cretica Linn. plant extract was prepared and suspended in 1% Tween-80 and used as oral administrant.

Experimental animals

Healthy male Wistar rats weighing between 150 and 200 g, were procured and experiments were designed in the following manner. The rats were divided into six groups consisting of six rats each.

Group I: Euglycemic or normal animals (normal saline 5ml/kg, once daily)

Group II: Hyperglycemic rats (alloxan 150mg/kg, i.p., once)

Group III: Hyperglycemic rats + Cressa cretica Linn. (low dose 200mg/kg, p.o., once daily)

Group IV: Hyperglycemic rats + Cressa cretica Linn. (high dose 400mg/kg, p.o., once daily)

Group V: Hyperglycemic rats + Glibenclamide (0.9 mg/kg, p.o., once daily)

Group VI: Hyperglycemic rats + vitamin E (100mg/kg, p.o., once daily)

(Note: i.p. = intraperitoneal, p.o. = post-operatively)

Serum lipid profile, serum insulin, biomarker enzymes, anti-oxidant enzymes in LTH of all the rats were recorded at weekly intervals. The values were expressed as mean ± SEM. The data were analyzed by one-way ANOVA followed by Dunnet’s Multiple comparison test, p < 0.05 was considered as significant.

Results and discussion

Preliminary phytochemical analysis of MECC showed the presence of flavonoids and terpenoids. The acute toxicity study in rats produced no death or signs of toxicity even at high dose (5g/kg) of the extract. In anti-diabetic study, the effect of various treatments on serum lipid profile, serum biomarker enzymes, serum insulin, anti-oxidant enzymes in LTH, MDA were studied and showed graphically (Figs. 1–4) (Grover et al., 2002). Pancreas of normal control and various treated diabetic rats were kept in 40% formalin later submitted to Jeevan Regional Diagnostics, Belgaum, Karnataka for histopathological studies. The specimens were processed by standard procedure and embedded in paraffin wax. The blocks were sectioned from the ventricular portion and 5 µ thick sections were stained according to the haematoxylin and eosin (H&E) method given by Smith and Burton. The sections were
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**Figure 3**  Effect of various treatments on insulin.

**Figure 4**  Effect of various treatments on anti-oxidant enzymes (LTH).

**Figure 5**  Effect of various treatments on histopathology of pancreas.
examined by light microscopy and micrographs were shown (Fig. 5).

**Conclusion**

The results obtained from the present study demonstrated that the orally administered high dose (400 mg/kg) of MECC significantly decreases the elevate blood sugar level, serum lipid profile, serum biomarker enzymes and significantly increased insulin, glycogen content in liver and muscle, possesses anti-oxidant property by virtue of its normalizing the impaired oxidative stress defence mechanism in the hyperglycemic rats.

*Cressa cretica* Linn. has been already proved to have anti-inflammatory and anti-fungal activity by virtue of its anti-oxidant constituents. So, this present study on anti-hyperglycemic activity also proved due to these active principles. *Cressa cretica* Linn. offers significant hypoglycemic agent in terms of preservation of endogenous anti-oxidants, scavenging of superoxide and hydroxyl radicals and inhibition of lipid per oxidation.

**References**


