

Anti-obesity effect of ethanolic extract from *Cosmos caudatus* Kunth leaf in lean rats fed a high fat diet

ABSTRACT

Background: Obesity is a major health concern both in developed and developing countries. The use of herbal medicines became the subject of interest for the management of obesity due to its natural origin, cost effectiveness and minimal side effects. The present study aimed at investigating anti-obesity potential of ethanolic extract from *Cosmos caudatus* Kunth leaf (EECCL). **Methods:** In this study, the rats were randomly divided into six groups i.e., (1) Normal Diet (ND); (2) Normal Diet and 175 mg/kgBW of EECCL (ND+175 mg/kgBW); (3) Normal Diet and 350 mg/kgBW of EECCL (ND+350 mg/kgBW); (4) High Fat Diet (HFD); (5) High Fat Diet and 175 mg/kgBW of EECCL (HFD+175 mg/kgBW); (6) High Fat Diet and 350 mg/kgBW of EECCL (HFD+350 mg/kgBW). The anti-obesity potential was evaluated through analyses of changes in body weight, visceral fat weight, and blood biochemicals including total cholesterol, triglycerides, high-density lipoprotein cholesterol (HDL-c), low-density lipoprotein cholesterol (LDL-c), leptin, insulin, adiponectin, ghrelin and fecal fat content. In addition, metabolite profiling of EECCL was carried out using NMR spectroscopy. **Results:** Rats receiving EECCL together with HFD showed significant ($p < 0.05$) reduction in body weight gain compared to rats receiving HFD only. At the end of study, the body weight gain of EECCL treated rats was not significantly ($p > 0.05$) different with those of ND rats. Other related obesity biomarkers including plasma lipid profiles, insulin, leptin, ghrelin and adiponectin levels also showed significant improvement ($p < 0.05$). Administration of EECCL caused significant ($p < 0.05$) increase in fecal fat excretion, which validates the hypothesis of lipase inhibition, an anti-obesity mechanism similar to standard drug of Orlistat. The $^1\text{H-NMR}$ spectra of EECCL ascertained the presence of catechin, quercetin, rutin, kaempferol and chlorogenic acid in the extract. **Conclusion:** Conclusively, EECCL showed anti-obesity properties by inhibition of intestinal lipid absorption and modulation of adipocytes markers.

Keyword: Anti-obesity; Herb; High fat diet; NMR; Rats