

Preventive Effect of Stem Bark Extracts of *Coula edulis* Baill. against High-Fat / High Sucrose Diet-Induced Insulin Resistance and Oxidative Stress in Rats

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Abstract : Background: Insulin resistance (IR) and oxidative stress are associated with obesity, diabetes mellitus, and other cardio metabolic disorders. The aim of this study was to investigate the effect of *Coula edulis* extracts (CEE) on insulin resistance and oxidative stress markers in high-fat/high sucrose diet-induced insulin resistance in rats. Materials and Methods: Thirty male rats were divided into 6 groups of 5 rats each fed, received daily oral administration of CE extracts for 8 weeks as follows: Group 1 or negative control group, fed with standard diet (SD); Group 2 fed with high-fat/high sucrose diet (HFHS) only; Group 3 fed with HFHS + CEAq 200; Group 4 fed with HFHS + CEAq 400; Group 5 fed with HFHS + CEET 200; Group 6 fed with HFHS + CEET 400. At the end of the experiment (8 weeks), animals were sacrificed plasma lipid profile, glucose, insulin, oxidative marker and digestive enzyme activities were measured. The homeostasis model assessment for insulin resistance (HOMA-IR) was determined. Results: Feedings with HFHS significantly ($p < 0.01$) induced plasma hyperglycaemia, hyperinsulinaemia, increased triglyceride, total cholesterol, and low-density lipoprotein levels, decreased high-density lipoprotein levels, alterations of α amylase, and glucose-6-phosphatase activities, and oxidative stress. Daily oral administration with CEE for eight weeks after insulin resistance induction had a hypolipidaemic action, antioxidative activities and modulated metabolic markers. Ethanolic extract at the higher dose had the best effect on body weight gain and insulin resistance, whereas aqueous extract showed the better activity on hyperlipidemia. Conclusion: These results suggest that CEAq and CEET at 400mg/kg are promising complementary supplements that can be used to protect better from metabolic disorders associated with HFHS.

Keywords : *Coula edulis* Baill, high-fat / high sucrose diet, insulin resistance, oxidative stress

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