



3rd International Conference on **Biomedicine & Pharmacotherapy**

Does polyphenolic-rich fraction of cornsilk (*stigma maydis*) exhibits anti-hyperglycaemic properties in streptozotocin-induced diabetic rats?

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Diabetes mellitus (DM) is an impairing chronic metabolic disorder associated with high blood glucose levels (hyperglycaemia) mainly due to insulin insensitivity. Polyphenols are known as potent compounds that are able to prevent the prevalence of diabetes. The present study was aimed to investigate in vivo anti-hyperglycaemic activity of a phenolic-rich fraction (PRF) of cornsilk and to characterize its principal constituents. The bioactive compounds in PRF were analyzed using the liquid chromatography-mass spectrometry/quadrupole time-of-flight (LC-MS/QTOF) system. The antioxidative potentials and anti-hyperglycaemic properties of PRF were subsequently evaluated by using in vivo methods in streptozotocin (STZ)-induced diabetic rats. Cornsilk extract was obtained using 40% ethanol, then sequentially fractionated into n-hexane, ethyl acetate and aqueous fractions. These fractions were used to evaluate the antioxidant capacities and to investigate protective effects on high glucose toxicity using human umbilical vein endothelial cells (HUVEC) as endothelial cell models via MTT assay. Results show that the ethyl acetate fraction had the highest antioxidant capacities. The PRF was found to be nontoxic to HUVEC. A high concentration of glucose (30 mM) treatment significantly induced HUVEC death, but PRF significantly restored the viability of HUVEC in a dose-dependent manner, compared to control. The LC-MS/QTOF analysis of PRF reveals the presence of 26 polyphenolic compounds and flavonoids being the major constituents. Flavonols, flavones, flavanols, flavone C-glycosides, flavonol O-glycosides, and isoflavonoids are the subgroups of flavonoids detected in the PRF. Flavanols were the major group of flavonoids detected in this PRF. Treatment of diabetic male rats with PRF at 100 and 200 mg/kg doses for 28 days significantly decreases blood glucose levels in diabetic rats. In brief, PRF could improve glycaemic control in diabetic rats which has a beneficial effect in correcting hyperglycaemia and preventing diabetic-related complications.

Keywords: Cornsilk, Polyphenolic-Rich Fraction, Anti-Hyperglycaemia

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