

Polyphenols: Isolation, Purification, Characterization and Evaluation of Various Biological Activities

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Abstract : The purpose of this study was to explore the cardioprotective and anti-inflammatory effects of polyphenol-rich extracts from cucurbitaceae family members, including Cucurbita pepo, C. moschata, and C. maxima, on rat models. The initial crude extracts from these cucurbits were further separated into hexane, chloroform, ethyl acetate, butanol, and aqueous ethanol fractions, labeled as HEF, CHF, EAF, BUF, and AEF, respectively. Of these, AEF yielded the highest amount, followed by BUF, HEF, EAF, and CHF in descending order. Notably, EAF contained the greatest concentration of total phenolics, flavonoids, and flavonols. In terms of antioxidant activity, EAF demonstrated the most potent DPPH radical scavenging capability, succeeded by CHF, BUF, AEF, and HEF. EAF also exhibited the strongest reducing potential among the fractions. RP-HPLC analysis identified various phenolic acids and flavonoids across the cucurbita fractions, including ferulic acid, vanillic acid, p-coumeric acid, gallic acid, p-hydroxybenzoic acid, chlorogenic acid, catechin, rutin, quercetin, myricetin, and kaempferol. Doses of 250 and 500 mg/kg body weight of cucurbita fractions were administered orally to male WKY rats daily for 21 days. The rats' body weight, heart rate, and blood pressure were monitored bi-weekly. Oxidative status assessments were conducted using plasma samples to measure levels of malondialdehyde (MDA), superoxide dismutase (SOD), reduced glutathione (GSH), nitric oxide (NO), and total antioxidant capacity (TAC). At the study's conclusion, surgical assessments, including blood pressure, pulse wave velocity (PWV), and echocardiograms (ECG) were performed. The findings indicated that EAF from cucurbita significantly enhanced antihypertensive and antioxidant activities in the SHR rat group.

Keywords : polyphenols, chlorogenic acid, antihypertensive activity, oxidative stress, lcms

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