

Metabolic profile and hepatoprotective activity of the anthocyanin-rich extract of *Hibiscus sabdariffa* calyces

Samira Mostafa ,Shahira M. Ezzat, Maha M. Salama, Sayed H. Seif el-Din, Samira Saleh, Naglaa M. El-Lakkany, Olfat A. Hammam, Maha B. Salem & Sanaa S. Botros

Abstract

Objectives: To evaluate the hepatoprotective effect and study the metabolic profile of the anthocyaninrich extract of *H. sabdariffa* calyces (HSARE).

Materials and methods: The hepatoprotective activity of HSARE was assessed (100mg/kg/d for 4 weeks) by examining the hepatic, inflammatory, oxidative stress markers and performing a histopathological examination in rats with thioacetamide (TAA)-induced hepatotoxicity. HSARE was analyzed using ultra-performance liquid chromatography-quadrupole-time-of-flight-photodiode array-mass spectrometry (UPLCqTOF-PDA-MS).

Results: The UPLC-qTOF-PDA-MS analysis of HSARE enabled the identification of 25 compounds represented by delphinidin and its derivatives, cyanidin, kaempferol, quercetin, myricetin aglycones and glycosides, together with hibiscus lactone, hibiscus acid and caffeoylquinic acids. Compared to the TAAintoxicated group, HSARE significantly reduced the serum levels of alanine aminotransferase, aspartate aminotransferase and hepatic malondialdehyde by 37.96, 42.74 and 45.31%, respectively. It also decreased hepatic inflammatory markers, including tumour necrosis factor alpha, interleukin-6 and interferon gamma (INF-c), by 85.39, 14.96 and 70.87%, respectively. Moreover, it decreased the immunopositivity of nuclear factor kappa-B and CYP2E1 in liver tissue, with an increase in the effector apoptotic marker (caspase-3 positive cells), restoration of the altered hepatic architecture and increases in the activities of superoxide dismutase (SOD) and glutathione by 150.08 and 89.23%, respectively.

Discussion and conclusion: HSARE revealed pronounced antioxidant and anti-inflammatory potential where SOD and INF-c were significantly improved. HSARE possesses the added value of being more water-soluble and of natural origin with fewer side effects expected compared to silymarin.

Pharmaceutical Biology 2017, November