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

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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