

ABSTRACT

Hibiscus sabdariffa Linn (Roselle) is a member of the Malvaceae family. The origin of *H. sabdariffa* is not fully known, but in Malaysia it was introduced by University of Malaya in early 1990s and commercially planted by the Department of Agriculture in Rhu Tapai, Terengganu. The present study was designed to investigate the pharmacological activities and phytochemical constituents of three different varieties of *H. sabdariffa* i.e. Arab, UKMR-1 and UKMR-2 variety. Pharmacological activities studied include determination of antioxidant activities in plant samples using DPPH radical scavenging assay, reducing power assay and metal chelating assay; the toxicity of plant samples in rat through repeated oral administration for 14 days at dose of 500 and 1000 mg/kg body weight/day; and the ability of aqueous extract of plant samples to reduce atherosclerosis development in hypercholesterolemic induced animals. The phytochemical constituents in aqueous extract of three different varieties of *H. sabdariffa* studied were preliminary determined through TLC method before further analyze using HPLC-MS/MS technique. The present investigations showed that the aqueous extract of Arab variety at concentration of 1000 µg/ml exhibits the best antioxidant activity compared to UKMR-1 and UKMR-2. *H. sabdariffa* from Arab variety also exhibit higher bioactivity effect on brine shrimp ($LC_{50} = 146.88$ µg/ml) compared to UKMR-1 ($LC_{50} = 503.58$ µg/ml) and UKMR-2 ($LC_{50} = 325.56$ µg/ml). This study also showed that consumption of diets containing up to 1000 mg/kg body weight/day of Arab, UKMR-1 and UKMR-2 aqueous extracts for 14 days were not associated with any obvious signs of toxicity in Sprague-Dawley rats. The anticholesterol effect study of these three varieties of *H. sabdariffa* extracts on induced hypercholesterolemic New Zealand White rabbits found that at the end of the induction period, body weight of the animals, triglyceride, total cholesterol, HDL and LDL level in

blood serum were significantly increase compared to the normal control. Though that, repeated oral administration for 60 days at dose of 250 mg/kg body weight/day of Arab and UKMR-2 extracts were resulted in slightly reduction in percentage of atheromatous plaque. Results from TLC analysis revealed those phenol and flavonoids groups are the major chemical constituent in aqueous extracts of Arab, UKMR-1 and UKMR-2. LCMS/MS analysis on aqueous extract of Arab variety found the present of gossypetin-3-O-glu-7-O-xylo, herbacetin-8-O-xylo-3-O-glu, delphinidin, delphinidin-3-sambubioside, cyanidin 3-sambubioside, and kaempferol-3-O-rutinoside were present in Arab extracts. Phytochemical analysis on UKMR-1 extract found the present of delphinidin-3-sambubioside, hibiscetine, delphinidin, gossypetin, herbacetin-8-O-xylo-3-O-glu, and quercetin rutinoside. While UKMR-2 sample extract contains hibiscetine, delphinidin, herbacetin-8-O-xylo-3-O-glu and quercetin rutinoside.