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Chemicals and cardiovascular activity evaluation of *Hibiscus sabdariffa* L. fruits extracts

Muhamad Bin Zakaria
University of Malaya, Malaysia

Hibiscus sabdariffa L. (roselle) is a member of the Malvaceae family. Roselle is native from India to Malaysia, where it is commonly cultivated and must have been carried at an early date to Africa. It has been widely distributed in the Tropics and Subtropics of both hemisphere and in many areas of the West Indies and Central America, has become naturalized. Plant polyphenols act as antioxidants mainly by trapping reactive oxygen species and by regenerating endogenous membrane-bound α -tocopherol (vitamin E). In both processes polyphenols are oxidized. Hence, knowledge of the oxidation mechanisms of polyphenols is important in understanding their antioxidant activity at the molecular level. This work initially focuses on anthocyanins (pigments), flavanols (tannins), and phenolic acids an important class of polyphenols which are relatively abundant in the human diet. The oxidation of the 3',4',7'-trihydroxyflavylium ion (1) and catechin (2), as models for anthocyanin and tannin, were investigated. Both polyphenols are shown to form o-quinone intermediates upon hydrogen atom abstraction and subsequent radical disproportionation. The quinone of 2 and a second antioxidant molecule would quickly couple to form dimers. In contrast, 1 is extensively degraded into coumarins by repeating sequences of oxidation. In aqueous solutions, 1 is a mixture of coloured and colourless forms. Chalcones (3) are also shown to take part in the antioxidant activity. Pharmacological studies demonstrated the extracts from the dried roselle calyx significantly lower the LDL level by 57% as well as reducing cholesterol deposition in Sprague Dawley rat's aorta. Toxicity evaluation of the roselle's extracts on Sprague Dawley rat showed no sign of toxicity. Anthocyanin of roselle calyces made up of sambubioside (β -D-xylopyranosyl-(1-2)-D-glucopyranoside of cyanidin or delphinidin. Red anthocyanin showed high anti-oxidative activities, besides gallic acid and protocatechuic acid found in the flower. The yellow flower contains flavonolglucoside; hibiscritin. By mimicking the stomach model, the flavonoids were broken-down to simple phenols which have an effect in lowering the LDL. In conclusion, roselle is a medicinally nutritive juice if consumed daily would have the potential in lowering blood cholesterol level and helps to improve cardiovascular activity through its high anti-oxidant activity.

mzak@um.edu.m