

Antioxidant Activity of Anthocyanin Glycoside Derivatives Evaluated by the Inhibition of Liposome Oxidation

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Cyanidin-3-glycosides (arabinoside, rutinoside, galactoside and glucoside) and delphinidin-3-rutinoside were examined for their ability to inhibit lipid peroxidation induced either by Fe(II) ions, UV irradiation or 2,2'-azobis(2-amidinopropane) dihydrochloride (AAPH) peroxyl radicals in a liposomal membrane system. The antioxidant abilities of anthocyanins were compared with a water-soluble tocopherol derivative, trolox. The antioxidant efficacies of these compounds were evaluated by their ability to inhibit the fluorescence intensity decay of the extrinsic probe 3-[*p*-(6-phenyl)-1,3,5,-hexatrienyl] phenylpropionic acid, caused by the free radicals generated during peroxidation. All the anthocyanins tested (at concentrations of 15–20 μM) exhibited higher antioxidant activities against Fe(II)-induced peroxidation than UV- and AAPH-induced peroxidation, suggesting that metal chelation may play an important role in determining the antioxidant potency of these compounds. It was also found that delphinidin-3-rutinoside had a higher antioxidant activity against Fe(II)-induced liposome oxidation than cyanidin-3-rutinoside, which indicates an important role of the OH group in the B ring of delphinidin-3-rutinoside in its antioxidant action. The antioxidant activity of all the anthocyanins studied was higher than that of trolox in the case of Fe(II)-induced liposome oxidation and was comparable with the action of trolox in the case of UV- and AAPH-induced liposome membrane oxidation.

Key words: Anthocyanin, Liposome, Antilipoperoxidative Agents