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Antioxidant activity of nasunin, an anthocyanin in eggplant.

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Abstract

Delphinidine-3-(p-coumaroylrutinoside)-5-glucoside (nasunin), an anthocyanin was isolated as purple colored crystals from eggplant peels, *Solanum melongena* L. 'Chouja'. Using an electron spin resonance spectrometer and 5,5-dimethyl-1-pyrroline-N-oxide (DMPO), spin trapping, hydroxyl (.OH) or superoxide anion radicals (O₂⁻) generated by the Fenton reaction or the hypoxanthine-xanthine oxidase system were measured as DMPO-OH or DMPO-OOH spin adducts. L-Ascorbic acid 2-[3,4-dihydro-2,5,7,8-tetra-methyl-2-(4,8,12-trimethyltridecyl)-2 H-1-benzopyran-6yl-hydrogen phosphate] potassium salt (EPC-K1) and bovine erythrocyte superoxide dismutase (SOD) were used as standards for .OH and O₂⁻, respectively. Nasunin directly scavenged O₂⁻ with a potency of 143±8 SOD-equivalent units/mg), and inhibited formation of DMPO-OH (0.65±0.07 EPC-K1 micromol/mg). A spectrophotometric study showed that nasunin formed an iron complex with a molar ratio of nasunin : Fe³⁺ of 2 : 1. Therefore, hydroxyl radical scavenging by nasunin is not due to direct radical scavenging but inhibition of .OH generation by chelating iron. Nasunin (1 microM) significantly protected against lipid peroxidation of brain homogenates (p<0.001) as measured by malonaldehyde and 4-hydroxyalkenals. These findings demonstrate that nasunin is a potent O₂⁻ scavenger and iron chelator which can protect against lipid peroxidation.

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