

Antioxidant properties of isotorachryson isolated from *Rhamnus nakaharai*

蕭哲志

Hsiao G;Ko FN;Lin CN and Teng CM

摘要

Abstract

Isotorachryson inhibited iron-induced lipid peroxidation with an IC₅₀ value of 1.64 ± 0.08 μM in rat brain homogenates, and was comparable in potency to butylated hydroxytoluene and was more potent than alpha-tocopherol or desferrioxamine. The mechanism of antioxidant properties were then examined. Isotorachryson could scavenge the stable free radical diphenyl-p-picrylhydrazyl. And it was an efficient direct scavenger of water-soluble peroxy radicals with stoichiometry factor of 0.53 ± 0.05 in the aqueous phase and also toward lipid-soluble peroxy radicals in tissue homogenates. The oxygen consumption during peroxidation induced by radicals on human erythrocyte ghosts was suppressed by isotorachryson. Furthermore, it was reactive towards superoxide anion with a second-order rate constant of 5.06 ± 0.65 × 10⁵ M⁻¹ S⁻¹. But it did not react with hydrogen peroxide detected within the sensitivity limit of our assay. Using ascorbate/iron ion/H₂O₂ as a hydroxyl radical generating system and deoxyribose as a probe, isotorachryson was effective with hydroxyl radicals with a second-order rate constant of 3.88 ± 0.54 × 10¹¹ M⁻¹ S⁻¹ under stimulation by iron-EDTA. On the other hand, isotorachryson retarded the peroxidation of human low density lipoprotein (LDL) initiated by both aqueous and lipophilic peroxy radicals. And it also suppressed copper-catalyzed human LDL oxidation, as measured by fluorescence intensity, electrophoretic mobility, and thiobarbituric acid-reactive substances formation in a concentration-dependent manner. Our results show that isotorachryson is potentially an effective and versatile antioxidant, and can help protecting LDL against oxidation.