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Antioxidant activities of extracts from different marine algal species

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Introduction

Free radical mediated oxidation of fats and oils is one of the major reasons for deteriorating the quality of lipid containing foods during processing and storage. Different marine algal species have been reported to possess number of biologically active compounds. Therefore, present study was carried out to evaluate antioxidant potentials of different extracts obtained from marine macro algal species.

Methods and Materials

Preparation of algal extracts

Algal samples were collected from Southern coast of South Korea during October to February. Lyophilized samples were powdered and extracted with 80% ethanol. The ethanol extract was fractionated into different groups according to polarity using different organic solvents.

Linoleic acid oxidation inhibition assay

Linoleic acid was oxidized in the presence of algal extracts in 95% ethanol to measure the antioxidant activity (Osawa et al., 1985). Standard antioxidants, alpha-tocopherol or butylated hydroxytoluene (BHT) were used as positive controls.

Radical scavenging activity assay

Hydroxyl (Rosen et al., 1984), carbon-centered (Hiramoto et al., 1993) and DPPH (Nanjo et al., 1996) radicals were generated as described previously and their scavenging activities by algal extracts were studied using ESR spectrometry.

Results and Discussion

Among the tested samples, 3 brown algal species and 1 green algal species exhibited overall high radical scavenging activities in their ethyl acetate extracts. Another 2 green algal species could scavenge free radicals relatively at higher concentrations in their ethanol fractions. In addition, ethyl acetate fractions of all 3 brown algal species exhibited greater scavenging activity compared to that of green algal species. Scavenging activities of these fractions on free radicals were in the order of hydroxyl, DPPH and carboncentered-radicals respectively.

Similar pattern of results were observed when the samples were tested for inhibition of lipid peroxidation in a linoleic acid oxidation model system. In the most potent ethyl acetate extract, lipid peroxidation activities were significantly ($P<0.05$) higher than that of alpha-tocopherol, but lower than that of BHT. However, lipid peroxidation results did not agree with the radical scavenging results observed for red algal species. Antioxidants are believed to act as scavengers of free radicals, inhibitors of radical generation or chelators of radical generating metal ions. These results clearly indicate that, some marine algal species especially brown algae have potent organic antioxidant compounds and they can be used as a potential source to identify new antioxidants.

References

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