In vitro activity assessment of antioxidative peptides derived from enzymatically hydrolyzed hoki (*Johnius belengerii*) skin gelatin

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Abstract

Active oxygen and free radicals are well known to induce many types of oxidative damage to biomolecules causing and or contributing aging, cancer and other life style related diseases[1]. Total antioxidative potential of hoki gelatin peptides was investigated considering different aspects of antioxidative mechanisms. Antioxidative activities were measured using ion chelation, radical scavenging using electron spin resonance (ESR) spectroscopy, retardation of lipid peroxidation and in oxidative biochemistry of cultured human cells. Purification included different chromatographic techniques. The antioxidative activity of trypsin hydrolisate of gelatin in a linoleic acid model system exhibited a higher activity than that of commercially available antioxidant α-tocopherol. Subsequent purifications isolated peptide fractions which closer to butylated hydroxy toluene (BHT). Hoki gelatin peptides could effectively quenched hydroxyl radical at a relatively low concentration. Superoxide radical scavenging was substantial and peptide fractions showed a comparatively weak affinity to quench alkyl and DPPH radicals. Ion chelating ability was lower than activity obtained from other methods. But same was increased dose dependently with consecutive purifications. Total antioxidant capacity of plasma and cellular antioxidative enzyme activities in cultures of normal human hepatocytes and human hepatoma cells (Hep3B) altered dose dependently. Peptide treated normal hepatocytes could remain viable after introducing t-butyl hydroperoxide (t-BHP). These results demonstrate that peptides derived from gelatin could be used as a strong non-hazardous natural antioxidant.

References

1. Rice-Evans C. A., Miller N. J., Bolwell P. G., Bramely P. M., Pridham J. B. (1995), The relative antioxidant activities of plant-derived polyphoenolic flavonoids, *Free Radic. Res.* **22**, 375-383.