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Nutraceutical From Marine Organism-Antioxidant peptide Derived From Oyster *Crassostrea gigas By Gastro-Intestinal Digestion*

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Introduction

Lipid oxidation, the reaction of oxygen with unsaturated lipids in biological systems and foods, has attracted a considerable research interest during the past few decades. Increasing evidences revealed that uncontrolled lipid peroxidation is involved in the occurrence of numerous chronic diseases (Pryor et al., 1982). In the recent reports (Moure *et al.*, 2006, Jeon *et al.*, 1999), bioactive peptides to act as antioxidants have been liberated from enzymatic hydrolysis or food processing, depending on their biochemical properties such as structure, composition and sequence. Several studies have reported in antioxidative peptides derived from seafood sources and their potentials to use as alternative antioxidants (Kim *et al.*, 2005, Je *et al.*, 2005, Jun *et al.*, 2004, Rajapakse *et al.*, 2005), however, it has rarely been studied on antioxidative properties of gastrointestinal digests. Therefore, in the present study, our interest was focused to present a potent antioxidant in gastrointestinal digests of Oyster, *Crassostrea gigas*, and to investigate its antioxidative properties in linoleic acid peroxidation system and using radical scavenging assay.

Materials and methods

1. Materials

Fresh mussel (M. coruscus) was obtained from a mussel aquafarm (Tongyoung, Korea) and kept under -30until use. Gastrointestinal enzymes including pepsin [EC 3.4.23.1], trypsin [EC 3.4.21.4], α -chymotrypsin [EC 3.4.21.1] and porcine pancreatic lipase [EC 3.1.1.3] were purchased from Sigma Chemical Co. (St. Louis, MO, USA).

2. Methods

After mincing edible parts (muscle) of Oyster *Crassostrea gigas* except shell, in vitro gastrointestinal digestion was performed using a dual batch reactor according to the method by Vermeirssen et al with slight modification.

Results and discussion

In this study, the conditions of in vitro gastrointestinal digestion leading to the formation and degradation of antioxidative activity peptide were investigated for protein of Oyster Crassostrea, the antioxidant peptide were purified from gastrointestinal hydrolysates using consecutive chromatographic methods on a Hiprep 16/10 DEAE FF anion exchange column and high an octadecylsilane (ODS) C18 reversed phase column. Finally, it amino acid sequences were determined. The potent peptide, Leu-Lys-Gln-Glu-Leu-Glu-Asp-Leu-Leu-Glu-Lys-Gln-Glu (1.60 kDa), exhibited the higher activity against polyunsaturated fatty acid (PUFA) peroxidation than those of native antioxidants, α -tocopherol. In free radical scavenging assay using electron spin resonance (ESR) spectroscopy, hydroxyl radical and superoxide radical were known as the most toxic reactive oxygen species (ROS) was quenched by 87.78% and 48.36% in the present of 100 ug/ml of *Oyester crassostrea* peptide.

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