

Antioxidant peptides purified and identified from the oil palm (*Elaeis guineensis* Jacq.) kernel protein hydrolysate

Abstract

Protein extracted from oil palm kernel was hydrolyzed using pepsin-pancreatin (OPKH) and subsequently used to identify the potential antioxidative peptides. Then, the OPKH was purified sequentially by ultrafiltration, reversed-phase and semi-preparative HPLC. Antioxidant capacities (ACs) of the purified peptides from OPKH were evaluated using ferric reducing antioxidant power (FRAP), β -carotene-linoleate bleaching (BCB) assay and 2,2'-azino-bis(3-ethylbenzthiazoline-6-sulphonic acid) (ABTS) radical scavenging activity assay. Amino acid compositions of the purified peptide fractions were also determined. The amino acid sequence of the antioxidative peptide was identified by liquid chromatography-electrospray ionization/multi-stage mass spectrometry (LC-ESI-Q-TOF-MS/MS) using de novo sequencing. There were nine fractions purified and collected where F6 demonstrated the highest AC. Three antioxidative peptides, Val-Val-Gly-Gly-Asp-Gly-Asp-Val (VVGGDGDV), Val-Pro-Val-Thr-Ser-Thr (VPVTST) and Leu-Thr-Thr-Leu-Asp-Ser-Glu (LTTLDSE) were identified in fraction F6. These peptides did not show any similarity with other antioxidant peptides listed in BLAST database of NCBI. These peptides may be useful ingredients in food and pharmaceutical applications.

Keyword: Oil palm kernel protein hydrolysate (OPKH); Antioxidative peptide; Amino acid sequence; (LC-ESI-Q-TOF-MS/MS); Peptide purification; HPLC