DETERMINATION OF FUNCTIONAL PROPERTIES OF PEPTIDES DERIVED FROM OVALBUMIN USING PROTEASE ENZYME UNDER DIFFERENT CONDITIONS

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M.A.A. MADUSHANI

Animal Science Degree Program

Department of Animal Science

Faculty of Animal Science and Export Agriculture

Uva Wellassa University of Sri Lanka

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Abstract

Ovalbumin is the major and most abundant protein in chicken egg white. Ovalbumin hydrolysates (OVH) have high biological and nutritive value. Therefore, OVH are widely used in manufacturing of dietary supplements and functional food. Objective of this research was to compare the peptides produce from ovalbumin using protease enzyme with different temperature, time and pH condition and check its hydrolysates for its functional properties. Ovalbumin was dissolved with 20mg/ml concentration and hydrolyzed using protease enzyme under different temperature conditions ranging from 37 ^{0}C to 50 ^{0}C, pH from 6.5–8.0 for 0-24 hrs. Level of hydrolyzing was observed with 15% SDS-PAGE gel electrophoresis system and visual observation. Best hydrolysates were subjected to functional properties using TBARS assay and DPPH Scavenging activity, antimicrobial assay, Fe^{2+} chelating activity and alpha amylase inhibitory activity. According to the TBARS assay, all OVH derived under different conditions show antioxidant property when compare with the oil emulsion ($p<0.05$). According to the DPPH assay, OVH which were produced showed some of scavenging activities under some conditions. OVH which was produced under 37 ^{0}C and pH 8 for 3hrs had the highest DPPH scavenging activity and was significant difference among the antioxidant properties observed ($p<0.05$). Concluding TBARS and DPPH values for the OVH which were derived under 37 ^{0}C and pH 8 for 3hrs conditions have good antioxidant property than the rest. However, all the OVH did not show good Fe^{2+} chelating activity. But there was a significant difference in Fe^{2+} chelating activity among the treatments ($p <0.05$) and trt12 showed highest chelating activity (11.19%±0.57) than the rest. According to the antimicrobial assay most of the OVH showed good antimicrobial property against *Salmonella spp.* and *E. coli* spp. And there was significant difference of antimicrobial property among the hydrolysates ($p <0.05$). OVH produced under 37 ^{0}C and pH 8 for 3hrs conditions showed highest antioxidant property and good antibacterial activity than the rest and it was the best condition to prepare OVH to having functional properties. However, applications of these peptides have to be further study for its applications in food industry.