

Antioxidant Property of Peptides Derived from Ovalbumin Using Protease Enzyme under Different Temperature and pH Conditions

M.A.A. Madushani^{1*}, A.L.Y.H. Aruppala¹ and E.D.N.S. Abeyrathne¹

¹*Department of Animal Science, Uva Wellassa University, Badulla, Sri Lanka*

Ovalbumin is the major and most abundant protein in chicken egg white. Ovalbumin hydrolysates (OVH) have high biological and nutritive value which facilitates the wide use in OVH as dietary supplements and functional foods. The objective of the study was to compare the peptides produced from ovalbumin using protease enzyme with different temperature, time and pH condition and check its' hydrolysates for its antioxidant properties. Ovalbumin was dissolved with 20 mg/mL concentration and hydrolyzed using protease enzyme under different temperature conditions ranging from 37 °C to 50 °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 evaluated for antioxidant properties using TBARS assay and DPPH Scavenging activity. Based on TBARS assay, all OVH derived under different conditions showed antioxidant property when compare with the oil emulsion ($p < 0.05$). According to the DPPH assay, OVH showed some level ($99.37 \pm 0.38\%$, $99.22 \pm 3.46\%$, $98.99 \pm 1.24\%$, $98.97 \pm 2.77\%$, $98.58 \pm 2.99\%$, $98.56 \pm 3.39\%$, $98.54 \pm 3.21\%$) of scavenging activities under conditions of; 37 °C/pH 8.0 (3 hrs); 40 °C/pH 7.0 (12 hrs), 45 °C/pH 6.0 (6 hrs), 8.0 (12 hrs) ; and 50 °C/pH 6.5 (9 hrs), 7.0 (6 hrs), 8.0 (24 hrs). OVH which was produced under 37 °C and pH 8 for 3 hrs had the highest DPPH scavenging activity and was significant difference ($p < 0.05$) among the antioxidant properties observed. In conclusion, TBARS and DPPH values for OVH which were derived under 37 °C and pH 8 for 3hrs conditions have good antioxidant property than the rest. However, applications of these peptides have to be further studied for its' applications in food industry.

Keywords: Ovalbumin hydrolysates, protease, antioxidant property, TBARS