

Antioxidant and antimicrobial activity of lecithin free egg yolk protein preparation hydrolysates obtained with digestive enzymes

Aleksandra Zambrowicz*, Marta Pokora, Ewelina Eckert, Marek Szoltysik, Anna Dąbrowska, Józefa Chrzanowska, Tadeusz Trziszka

Wroclaw University of Environmental and Life Sciences, Department of Animal Products Technology and Quality Management; Chelmonskiego 37/41, 51-630 Wroclaw, Poland

*Corresponding author: Dr Aleksandra Zambrowicz, Phone number: (48) 71 320 7773

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ABSTRACT:

Several biological activities have now been associated with egg protein- derived peptides, including antihypertensive, antimicrobial, immunomodulatory, anticancer and antioxidant activities, highlighting the importance of these biopeptides in human health, and disease prevention and treatment. Special attention has been given to peptides with antioxidant and antimicrobial activities as a new source of natural preservatives in food industry. In this study, the antioxidant properties of the egg-yolk protein by-product (YP) hydrolysates were evaluated based on their radical scavenging capacity (DPPH), Fe²⁺ chelating effect and ferric reducing power (FRAP). Furthermore, antimicrobial properties of obtained hydrolysates against *Bacillus* species were studied. The degrees (DHs) of hydrolysis for 4h hydrolysates were: 19.1%, 13.5% and 13.0%, for pepsin, chymotrypsin and trypsin, respectively. Pepsin was the most effective in producing the free amino groups (1410.3 μmolGly/g). The RP-HPLC profiles of the protein hydrolysates showed differences in the hydrophobicity of the generated peptides.

Trypsin hydrolysate obtained after 4h reaction demonstrated the strongest DPPH free radical scavenging activity (0.85 μmol Trolox_{eq}/mg). Trypsin and chymotrypsin hydrolysates obtained after 4h reaction exhibited 4 times higher ferric reducing capacity than those treated by pepsin. The hydrolysis products obtained from YP exhibited significant chelating activity. The 4h trypsin hydrolysate exhibited weak antimicrobial activity against *B. subtilis* B3; *B. cereus* B512; *B. cereus* B 3p and *B. laterosporum* B6.

Keywords: Antioxidative activity, DPPH, peptides, hydrolysis, egg-yolk protein