

TYROSINASE INHIBITORY ACTIVITY OF PEPTIDES FROM BLACK CRICKET (*Gryllus assimilis*) PROTEIN HYDROLYSATES

NOVELLI¹, P.K.; DE MATOS¹, F.M.; DE CASTRO¹, R.J.S.

¹University of Campinas, School of Food Engineering, Department of Food Science –
São Paulo, pnovelli@hotmail.com, franciellemirandadematos@gmail.com,
ruann@unicamp.br.

Keywords: bioactive peptides, black crickets, tyrosinase inhibitory activity.

Abstract: Tyrosinase is a copper-containing enzyme that has a key regulatory activity on the synthesis of melanin through the hydroxylation of L-tyrosine to L-DOPA and consequent oxidation to dopachrome. This action can result in browning reactions in damaged fruits and vegetables and in skin pigmentation disorders. The main objective of this work was to evaluate the production of black cricket protein hydrolysates as a source of peptides with tyrosinase inhibitory activity. The protein concentrate was hydrolyzed with three commercial proteases (Flavourzyme[®] 500L, Alcalase[®] 2.4L and Neutrase[®] 0.8L) and their mixtures using a simplex centroid mixture design. The tyrosinase activity was measured using L-Dopa as substrate and the final results were expressed as inhibitory activity (%) in relation to the control sample. The values for tyrosinase inhibitory activity ranging from 44.19% to 59.73% when the protein hydrolysates were produced with Neutrase and Alcalase, respectively. The statistical analysis indicated that the most prominent synergistic effect between the enzymes on generation of protein hydrolysates with tyrosinase inhibitory activity was detected for the ternary combination of the proteases. The coefficient of determination ($R^2 = 0.83$) and the F test ($F_{\text{calculated}} / F_{\text{tabulated}} = 6.11 / 3.52$) confirmed the quality of fit of the models for predictive purposes. These results allowed to conclude that the peptides from black cricket may have potential applications in the food and cosmetic industries as emerging antibrowning agents or skin whitening compounds.

Acknowledgements: This study was financed by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Brasil (CAPES) – Finance code 001(Process Number 88882.305864/2018-01) and National Council for Scientific and Technological Development (CNPq) - Process Number 430579/2018-7. Acknowledgments to Agrin Criação e Comércio de Insetos LTDA for gently donating the black crickets.