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Recovery of the Protein Component from Agricultural Waste Biomasses through Proteolytic Enzymes Immobilized on Biopolymer Supports**Nicolò Montegiove***University of Perugia, Italy*

In recent years, the use of enzymes in industry, particularly in their immobilized form, has attracted considerable interest, as their specificity and ability to work under mild conditions of temperature and pH make these biological catalysts suitable to regulate several kinds of processes. In particular, immobilized enzymes are becoming increasingly useful tools in numerous industrial procedures, such as the treatment of agricultural waste biomasses. The recovery of biomass protein components represents an extremely exciting challenge that can be faced by the production of protein hydrolysates, which constitute high-added-value products with great potential. Moreover, enzymatic catalysis would guarantee both lowering the process's environmental impact compared to conventional thermal hydrolysis, and raising the product quality, due to the reproducible formation of low molecular weight peptides with interesting and often unexplored biological activities. In this light, the aim of this work was the covalent immobilization of proteases from *Aspergillus oryzae* on a multifunctional and versatile 3D-printed biopolymer, i.e. polylactic acid (PLA), in order to develop a laboratory-scale continuous-flow bioreactor for the hydrolysis of agricultural waste biomasses. In addition, the system was subjected to a simultaneous biochemical and physical characterization to assess its resistance to pH and temperature variations. The newly-developed bioreactor proved able to recover free amino acids and small peptides. These high-added-value products with multiple properties can find applications in numerous industrial sectors and can also be attractive for nutraceutical uses. Moreover, this innovative application is in line with the guidelines for a sustainable future of the Circular Economy, which envisages the conversion of waste into resources.

Biography

Nicolò Montegiove studied at the University of Perugia (Italy), where he was granted a Master's Degree with honors in Biomedical and Molecular Sciences. During his career, he had the possibility to work in different Italian and foreign research institutes. He is now doing his Ph.D. in Molecular and Industrial Biotechnology at the Department of Chemistry, Biology and Biotechnology of the University of Perugia (Italy) concerning the study of enzymatic immobilization for industrial applications. He has published more than 10 papers in reputed journals.