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ENZYMATIC HYDROLYSIS OF MICROALGAE PROTEINS: CHARACTERIZATION AND TECHNOFUNCTIONAL PROPERTIES

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The growing interest in sustainable and bioactive protein sources has stimulated research on microalgae such as *Chlorella* and *Scenedesmus obliquus*, owing to their high protein content and functional and therapeutic potential. In this context, studies have analyzed the production and optimization of peptides and enzymatic hydrolysates derived from these microalgae with the aim of developing ingredients with technological properties and health benefits, particularly in hypertension control and functional food applications. The first study focused on the production of angiotensin-converting enzyme (ACE)-inhibitory peptides through ultrasound-assisted enzymatic hydrolysis of the *Chlorella* protein. Optimized conditions (3% alcalase, 40 °C, and 10 min) yielded low-molecular-weight peptides with high antioxidant activity and significant ACE activity. *In silico* analyses confirmed the safety and bioactivity of 47 identified peptide fragments. The second study focused on optimizing enzymatic hydrolysis using alcalase and trypsin in protein isolates from *Scenedesmus obliquus,* and evaluated the functional properties of the hydrolysates, including solubility, emulsifying capacity, and antioxidant activity. Balanced enzymatic combinations produced peptide fractions with improved functional performance and greater technological applicability. Overall, these findings demonstrate that optimized enzymatic processes, with or without ultrasound, enhance the protein utilization of microalgae, leading to the generation of compounds with bioactive and functional properties of interest in the food and pharmaceutical industries. It was concluded that hydrolyzed microalgal proteins represent promising alternatives for the development of natural ingredients with positive impacts on human health and the advancement of more sustainable and technologically efficient food products.

Referências bibliográficas:

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