Enhanced Recovery of Bioactive Compounds from Onion Skin Waste: Comparative Analysis of Extraction Methods

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Abstract

Bioactive compounds obtained from onion skin waste can be used as raw materials in the food industry, in pharmacy and medicine, in cosmetics, in agriculture and in various other industries. During this scientific research, we analyzed the efficiency of conventional and green extraction methods using different organic solvents to maximize the recovery of bioactive compounds from onion skins. During the extraction process, solvents with different polarities such as ethanol, methanol and water were used to evaluate their impact on the extraction yield. From the obtained results, it was clear that both the extraction method and the solvent used affected the extraction efficiency. From the results obtained, the highest yield of bioactive compounds was obtained using ultrasound assisted extraction with methanol, while maceration using ethanol produced relatively lower yield, but still significant. The findings suggest that optimizing extraction techniques and solvent selection can effectively increase the valuation of onion skin waste, obtaining valuable natural products rich in antioxidants, contributing to sustainable waste management and promoting a circular economy.

Keywords: onion skin waste, bioactive compounds, solvent extraction, green extraction, sustainable valorization

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