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HYDROPHOBIC DEEP EUTECTIC SOLVENTS: PROMISING GREEN MEDIA FOR BIOMASS TREATMENT

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Abstract

Among various types of biomass, microalgal biomass is recently considered one of the promising resources of different high-added value products such as pigments, proteins, carbohydrates and lipids, that have various applications in food, cosmetics, and pharmaceuticals industries [1]. However, the extraction and purification of microalgae compounds can be challenging due to their complex chemical composition and the low concentrations of the desired compounds in the biomass. It is well known that classic methods of extraction include long-term processes that require large amounts of energy, high temperatures, and have a negative impact on the environment [2]. In recent decades, the growth of the pharmaceutical industry, especially in areas containing bioactive components, has resulted in rapid development more environmentally friendly methods for the extraction, isolation and recovery of bioactive components using “green solvents” with the aim of preserving their properties during the process. Due to their low toxicity, biodegradability, and possibility for reuse, deep eutectic solvents, have great potential in order to replace conventional organic solvents for biomass processing [3,4]. Deep eutectic solvents based on natural ingredients are a promising alternative for extraction those compounds compared to conventional organic solvents. Such solvents consist terpenes, sugars, organic acids, etc. The possibility of adjusting the physico-chemical properties enables the optimization of their selectivity for bioactive compounds. In this paper, hydrophobic deep eutectic solvents were prepared from natural neutral ingredients. Physico-chemical characterization was performed on deep eutectic solvents that were chemically stable. This study aims to determine whether hydrophobic deep eutectic solvents can be used in accordance with principles of "green chemistry" for biomass treatment in order to extract a variety of bioactive compounds while preserving their properties and minimizing adverse environmental effects.

Keywords: *Biomass, Solid-liquid extraction, Pigments, Deep eutectic solvents*

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