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NATURAL DEEP EUTECTIC SOLVENTS EXTRACTION OF ANTHOCYANINS FROM BLACK RASPBERRY (*Rubus occidentalis* L.) POMACE

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At industrial levels, a large amounts of fruits by-products are made. For overcoming challenges related to consequential environmental and economical elements, the re-utilization of redundant fruit biomass, as a source of active compounds with therapeutic properties, represent an idea that gained a lot of scientific community interest. Moreover, green extraction methods and selection of an appropriate solvent should be an integral part of achieving this goal. Thus, this study aimed to investigate the effect of natural deep eutectic solvents (NaDES) in comparison with conventional solvents on the ultrasound assisted extraction of cyanidin-3-O-rutinoside and total anthocyanins from black raspberry fruit pomace (*Rubus occidentalis* L., Rosaceae), their stability at 4, 25 and 40 ◦C, as well as to evaluate the impact of hydroxypropyl-β-cyclodextrin (HPβCD) on extraction capacity of NaDES and water. A range of NaDESs, composed of hydrogen bond donors (choline chloride or betaine) and hydrogen bond acceptors (organic acids, sugars, polyols, amide), were screened. Based on total anthocyanins content (TAC) and antioxidant activity, citric acid-choline chloride NaDES was selected for extraction conditions optimization by Box-Behnken design coupled with response surface methodology. The optimal conditions were found to be an extraction time of 52.93 min, a temperature of 65 ◦C, and 15.60% (*w/w*) water in NaDES, resulting in maximized extraction yields of target compounds, cyanidin-3-O-rutinoside (7.60 mg/g DW) and TAC (6.88 mg CGE/g DW). A 30-day stability study revealed that NaDES provided the best anthocyanins preservation at defined temperature range compared to extracts prepared with water, 70% ethanol and 70% methanol. By incorporating different concentrations of HPβCD (1.5, 3 and 6%, *w/w*) in citric acid-choline chloride NaDES, downward trend was observed, while in the case of water anthocyanins extraction was improved. Black raspberry fruit pomace is a promising herbal drug rich in anthocyanins that can be used in green technology oriented pharmaceutical and cosmetic industries.

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