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# ULTRASOUND-ASSISTED NATURAL DEEP EUTECTIC SOLVENTS EXTRACTION OF BIOACTIVE COMPOUNDS FROM ROSEHIP FRUITS

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Wild rose (*Rosa canina* L.) is a deciduous shrub belonging to the family Rosaceae, which represents a source of fruits with special nutritive and medicinal value. Numerous phytochemical analyses have reported that rosehip fruits are rich in ascorbic acid and carotenoids, along with different groups of polyphenols. Due to such a unique chemical composition, rosehip fruits are used as traditional herbal medicine in the treatment of colds and chills, for the alleviation of pain and joint stiffness related to osteoarthritis, as well as in skin care. Bearing in mind the growing emphasis on environmental and economic sustainability, green extraction techniques have become significant for obtaining extracts with favourable characteristics. The aim of this study was to evaluate the impact of natural deep eutectic solvents (NaDESs) and 70% ethanol as conventional solvent on the ultrasound-assisted extraction of total phenolics and total carotenoids from rosehip fruits (*Rosae pseudo-fructus*). After screening analysis, in which six NaDESs (betaine/citric acid; betaine/malic acid; citric acid/sucrose; malic acid/sucrose; citric acid/glycerol; malic acid/glycerol) were evaluated, NaDES composed of betaine and citric acid at a molar ratio of 1:1 was selected as the most promising for the simultaneous extraction of total phenolics and total carotenoids, in addition to the greatest antioxidant activity. The optimal extraction conditions, established by the Box-Behnken design coupled with response surface methodology, were found to be 50.0% (w/w) water in NaDES, an amplitude of 43.1% and extraction time of 11.6 min, under which the extraction yield for total phenolics was 125.0 mg/g and for total carotenoids 247.3 µg/g of dry rosehip fruits, exceeding the amount of total phenolics (49.6 mg/g) and total carotenoids (49.9 µg/g) determined in the case of 70% ethanol. These results point out that betaine/citric acid NaDES allowed efficient extraction of bioactive compounds from rosehip fruits, whereas the obtained extract holds a great potential for incorporation into natural-based products.

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