

Optimalization of NADES-based polysaccharide extraction from carrot pomace

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Poland, as one of the leading producers of carrots in Europe, generates a huge amount of carrot pomace as a result of juice production. Until today it was treated as waste but in terms of sustainable development this type of waste can be used as a valuable raw material for other processes of obtaining of fine chemicals [1].

Carrot pomace has prebiotic properties due to its high pectin content. This type of polysaccharide with high amount of uronic acids can be a food source for the symbiotic human intestinal microflora, such as Bacteroidetes and Firmicutes. Both groups of bacteria provide a set of enzymes needed not only to depolymerize complex polysaccharides structures, but also play a role in the fermentation of monosaccharides into short-chain fatty acids (SCFAs). SCFAs are used by numerous organs of the human body to produce beneficial chemicals, e.g. the liver utilizes SCFAs to produce cholesterol or to synthesize glutamine and glutamate [2].

In the presented study, response surface methodology (RSM) was used as a tool to optimize the process of obtaining polysaccharides from industrial carrot root pomace. The independent variables were: (i) extraction time and (ii) the molar ratio of components forming the natural deep eutectic solvent (NADES), i.e. choline chloride, glucose, and citric acid. NADES as an environmentally friendly alternative can successfully replace strong acids that are used to extract pectins on an industrial scale. The product obtained in the optimized process parameters was analyzed using spectrophotometric and chromatographic methods.

Acknowledgements

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Bibliographic references:

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