

INFLUENCE OF ULTRASONICATION ASSISTED EXTRACTION ON THE CONTENT OF BIOACTIVE COMPOUNDS AND ANTIOXIDANT ACTIVITY IN GRAPE MARC EXTRACTS

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Ultrasonication is an efficient technique for extracting intracellular bioactive compounds from the plant matrix. The red grape marc from the "Isabella" variety was used for the research. The influence of the duration of ultrasonication assisted extraction (UAE) of 10 and 60 min and of the extraction temperature 30 and 65°C on the total polyphenol content (TPC), total anthocyanins content (TAC) and antioxidant activity (AA), determined by the DPPH test, in the ethanolic extracts of 60% (v/v) of grape marc. The obtained results attest that the temperature has a pronounced influence on the UAE efficiency on the TPC and TAC in grape marc extracts. It was shown that by increasing the extraction temperature from 30 to 65°C when applying of ultrasound for 10 min, the extraction of the TPC and TAC increased by 10.6% and respectively 13.4%. In the case of application of ultrasound for 60 minutes, the extraction yield of polyphenols and anthocyanins increased by 11.9% and 14.3% respectively. The growth in the extraction efficiency of phenolic compounds is due to the production of matrix bonds broken, solubility of phenolic compounds, speed of solvent diffusion and mass transfer increased, reduction of viscosity and solvent surface tension. It was shown that at the extraction temperature of 65°C, increasing the duration of ultrasound application from 10 to 60 min, the TPC and TAC were reduced by 3.7% and respectively by 7.6%. The long duration of ultrasound application has helped to reduce the amount of polyphenolic compounds due to cavitation, which changes of diffusion velocity, accelerating chemical reactions and degradation of enzymes. The highest values of antioxidant activity correspond to the extraction rate of phenolic compounds at the temperature of 65°C and the duration of ultrasound application 10 min, being 16.74 mmol TE/100 g d.w. The accentuated influence of the extraction temperature on the TPC, TAC and AA compared to the duration of ultrasound application was demonstrated.

Keywords: ultrasonication assisted extraction, grape marc extracts, bioactive compounds

Acknowledgment: The authors would like to thank the Project 2SOFT/1.2/83 Intelligent valorisation of agro-food industrial wastes (INTELWASTES), funded by the European Union, within the program Cross border cooperation Romania - Republic of Moldova 2014-2020.