

## F.22. INFLUENCE OF EXTRACTION CONDITIONS ON BIOLOGICALLY ACTIVE COMPOUNDS AND ANTIOXIDANT ACTIVITY IN GRAPE MARC EXTRACTS

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**Abstract.** Grapes are one of the main crops in the Republic of Moldova and in Romania, which are processed and consumed fresh. It is estimated that 10-13 million tonnes of marc are produced worldwide when grapes are processed. Grape marc consists of bunch, seeds and skin, constituting approx. 23% by mass of grapes processed for wine. At present, special attention is paid to the recovery of grape marc, as most of the waste is stored or incinerated, posing significant risks to the environment - pollution of water, soil and atmosphere. After processing grapes, about 70% of polyphenols remain into residues. Polyphenols are bioactive components with antimicrobial and antioxidant actions and can be used in food formulations. The aim of this research was to determine the influence of solvent composition and extraction temperature on the yield of phenolic compounds and antioxidant activity in grape marc extracts. Isabella red grapes marc was used for the research, which was dried at a temperature of 65 °C to a humidity of 7.3±0.1% and crushed to a granularity of 70±10 μm.

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To study the kinetics of the extraction process in solid-liquid system and to determine the optimal conditions for extraction, hydromodules from 4 to 20 were used, where distilled water was used as solvent. To investigate the yield of biologically active compounds, hydroalcoholic extracts of marc were obtained at concentrations of ethanol 0% (water), 40%, 60%, 80%, 96% (v/v), at temperatures of 30 °C, 45 °C and 65 °C, under mechanical stirring at 60 min<sup>-1</sup>, extraction duration 90 min. The extracts obtained were filtered and stored at 4±1°C. The total content of polyphenols, flavonoids, tannins, anthocyanins and the antioxidant activity by DPPH were analyzed in extracts. Under optimal extraction conditions, the individual profile of polyphenols and anthocyanins was identified and quantified by HPLC method. It was found that when the extraction temperature is increased from 30 to 65 °C, the content of phenolic compounds and antioxidant activity increases with the variation of the concentration of ethanolic solution up to 60% (v/v) and then decreases to 96 % (v/v). Thus, at 65 °C, the maximum values of phenolic compounds content and antioxidant activity were attested for hydroalcoholic solutions of 60% (v/v): total content of polyphenols - 11.02 mg GAE/g d.w., total content of flavonoids - 7.76 mg GAE/g d.w., tannins - 1.37 mg TAE/g d.w., total anthocyanin content - 0.97 mg ME/g d.w. and antioxidant activity - 91.55% free radicals inhibited. The composition of individual polyphenols and anthocyanins in grape marc extracts was determined by the HPLC method. The results of the research showed that the use of by-products derived from the wine industry would allow to reduce to a minimum the amount of residues and to obtain valuable extracts of bioactive compounds, with multiple fields of application.

**Keywords:** Grape marc, extraction conditions, biologically active compounds, antioxidant activity.

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