

## THE INFLUENCE OF MICROWAVE-ASSISTED EXTRACTION PARAMETERS ON THE YIELD OF BIOACTIVE COMPOUNDS IN GRAPE MARC EXTRACTS

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The vine (*Vitis vinifera* L.) is a species of plant from the genus *Vitis*, family *Vitaceae*. When processing grapes, grape marc is generated, which consists of skin, seeds and stems. Grape marc is rich in extractable phenolic antioxidants. Anthocyanins, catechins, procyanidins, flavonolic glycosides, phenolic acids and stilbenes are the main phenolic components in marc. The grape seeds are rich in extractable phenolic antioxidants such as phenolic acids, flavonoids, procianidines and resveratrol. The purpose of the work is to determine the influence of microwave-assisted extraction (MAE) parameters compared to the conventional method (maceration) on the yield of biologically active compounds with high antioxidant activity.

For extraction, grape pomace was dried at a temperature of  $65\pm 1^\circ\text{C}$  to a humidity of  $8.3\pm 0.2\%$  and crushed to powder with a particles size of  $60\pm 10\mu$ , then sieved. The conventional extraction was carried out at a temperature of  $30^\circ\text{C}$ ,  $45^\circ\text{C}$  and  $65^\circ\text{C}$ , using different concentrations of ethanol (0% (water), 40%, 60%, 80% and 96% (v/v)), time for 90 min. The MAE was performed at the same extraction conditions as in the case of maceration, but at the magnetron power 700 W, the filling coefficient 25%, the microwave frequency 2400 MHz, the microwave pulse duration 100ms – 10s. The duration of the extraction was 5 min. The total content of polyphenol (TPC), flavonoid (TFC), tannin (TC), and anthocyanin (TAC) were determined by the spectrophotometric method. The individual profile of the polyphenols by the HPLC method was identified. The antioxidant activity (AA) was determined by the DPPH method. The correlation between the content of biologically active compounds and the AA was analyzed.

The obtained results attest that MAE increased the yield of phenolic compounds and the antioxidant activity of hydroalcoholic extracts from grape marc compared to conventional extraction. In the case of the TPC, it increased 1.7 times; for the TFC - 1.2 times; for the TC and TAC increased 2.1 and 1.4 times respectively. The maximum values of antioxidant activity in grape marc extracts correspond to the maximum values of TPC, TFC TC, TAC, obtained at  $65^\circ\text{C}$  in 60% (v/v) EtOH solutions, demonstrating a direct correlation. In the hydroalcoholic extracts from grape marc powders the same groups of phenolic compounds were identified as in the case of extracts obtained by the conventional method under similar conditions.

**Keywords:** grape marc, microwave assisted extraction, biologically active substances.

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