

PROFILE OF LIPOPHILIC AND HYDROPHILIC EXTRACTS FROM *FETEASCA NEAGRĂ* BY-PRODUCTS

Angela GUREV¹, Veronica DRAGANCEA¹, Svetlana HARITONOV¹, Boris GAINĂ²

¹ *Technical University of Moldova, Chisinau, Moldova*

² *Academy of Sciences of Moldova, Chisinau, Moldova*

Abstract: Grapes grown in Republic of Moldova are widely used in the wine and juice industry, whereas, the functional compounds, recovered from wine by-products, are not fully exploited. After analyzing the seeds separated from fermented pomace of the local *Feteasca Neagră* (*Black Maiden*) grapes, grown on the vineyards of Nisporeni (F_N), Hâncești (F_H) and Speia village, Anenii-Noi (F_S), in the season of 2020, the physico-chemical indicators as well as the content of the bioactive substances in lipophilic and hydrophilic extracts, were determined. The content of carotenoids and polyphenols, in lipophilic extracts, was determined by spectrophotometric methods. F_N and F_S oils have an increased carotenoid content, of 49.703 ±0.424 and 48.533 ±0.466 mg/100g of oil. The highest concentration of phenolic compounds was recorded for the F_N oil, of 4.89± 0.05 mg GAE/100g of sample (which is approximately 0.005%). The oil quality indices were also determined.

Hydrophilic extracts were obtained by the ultrasound-assisted extraction method. The total content of polyphenols (TPC) and flavonoids (TFC) in the hydrophilic extracts from non-degreased (I) and degreased (II) grape seeds, was determined by colorimetric methods, with Folin Ciocalteu reagent. Results were expressed in mg GAE/g, mg QE/g and mg RhE/g of seeds. It has been proved that seed degreasing leads to a better solubilization of polar substances, therefore, extracts II contain up to 28.30% more polyphenolic compounds, compared to extracts I. However, the spectrophotometric analysis with AlCl₃, showed that washing and degreasing the seeds with hexane-n, removes the protective layer of tannins – the soluble proanthocyanidins on the surface of the seeds, and reduces the content of flavonoids in extracts II. Research shows a TPC twice higher in F_N extracts II, if compared to F_H and F_S. Meanwhile, the highest TFC was detected in F_H extract I. The difference between the content of biologically active substances in F_N, F_H, and F_S seeds is permissible within the same grape type, and is largely due to cultivation conditions. After determining the antioxidant activity (the Trolox equivalent antioxidant capacity assay), it was noted that the lipophilic and hydrophilic extracts from *Feteasca Neagră* seeds inhibit the DPPH free radical, the highest value being recorded for the hydrophilic extracts.

The 7th International Conference: "**Ecological and Environmental Chemistry-2022**", March 3-4, 2022, Chisinau, Republic of Moldova
EEC-2022 Abstract Book, Volume 1, DOI: <http://dx.doi.org/10.19261/eec.2022.v1>

Grape seeds are a valuable source of bioactive substances and phytonutrients, which can be recovered and then incorporated into various foods, thus increasing their nutritional value and turning them into functional foods with health benefits.

Keywords: antioxidant capacity, flavonoids, grape, phenols, seeds, oil, waste

Acknowledgment: The research was carried out with the support of the Moldova State Project 20.80009.5107.09 "Improvement of food quality and safety by biotechnology and food engineering".