PRIORITY DIRECTIONS FOR THE RECOVERY OF WINE WASTE IN THE REPUBLIC OF MOLDOVA

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Global grape production exceeds 80 million tones, of which 75% is destined for wine production (2018, FAO). Winemaking generates about 20-30% residual products, the most important being grape pomace. These by-products are used in the production of wine distillate, serve as fertilizer or animal feed, but most often remain unused. Disposal of this waste creates environmental problems, such as groundwater and surface water pollution, the spread of disease vectors, and excessive oxygen consumption in soil and groundwater. Biodegradation of this waste is slow due to low pH and the presence of compounds with antibacterial properties, such as polyphenols. At the same time, grape pomace contains significant amounts of biological active compounds that can be considered beneficial to health. Grape seeds are composed of 40% fiber, 10-20% lipids, 10% protein, and the rest are sugars, polyphenolic compounds and minerals. Dietary fiber and polyphenolic compounds remain in the pomace after the vinification process in significant quantities (approximately 70%). Some fiber from grape pomace forms chemical bonds with phenolic substances and thus generate antioxidant dietary fiber, giving them the capacity for radical uptake. This gives them a higher nutritional value compared to the dietary fiber in cereals.

Together with dietary fiber, polyphenols are the most valuable grape pomace compound with beneficial properties for health, such as maintaining intestinal health, preventing chronic diseases, cancer, etc. The antioxidant potential of polyphenols allows their use in food preservation due to inhibition of lipid oxidation and important antibacterial effect. The mechanisms of antioxidant activity are based on their structure and include the ability to capture radicals, donate electrons, or chelate metal ions. Anthocyanins are potential food coloring, but being susceptible to changes due to light, temperature, pH or other external factors, it is necessary to stabilize these pigments.

Grape pomace may also contain compounds that are dangerous to health - mycotoxins, including ochratoxin A, which is classified as carcinogenic. The production of this mycotoxin is influenced by climatic conditions, grape variety, crop damage and other factors. Over 90% of ochratoxin A in grape processing is retained in pomace. This imposes the need to verify the DNA presence of toxigenic species and, depending on their absence/presence, the subsequent distribution of grape pomace for processing. In the presence of genotoxic species, grape pomace could be used for composting or methanation. The thermal stability of ochratoxin A at temperatures up to 250 °C makes contaminated grape pomace unavailable even for sorbent production.Thus, the management of grape pomace waste is an important environmental issue. On the other hand, grape pomace as a by-product of wine production is a valuable source of important nutrients. But for the recovery of this product a rigorous microbiological control is necessary, after which the uncontaminated pomace will be directed for the extraction of biologically active compounds (polyphenols, anthocyanins, fibers) with the subsequent processing of depleted pulp to obtain sorbents for water purification (Good Practice Guide). Otherwise, the contamined grape pomace is to be directed for composting or methanation.

Keywords: *winemaking, grape pomace, dietary fiber, polyphenols, ochratoxin A.*

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