THE EFFICIENCY OF EXPERIMENTAL ACTIVATED CARBONS FROM VEGETABLE WASTE IN REDUCING THE RISK OF OXIDATION IN WHITE GRAPE MUSTS

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One of the major issues in wine production is their oxidation during the winemaking process, which is manifested by a significant decrease in organoleptic qualities, particularly the reduction of varietal aromas, and primarily affecting chromatic characteristics. Pre-fermentative and alcoholic fermentations of grape musts, as well as post-fermentative oxidation of young wines, are mainly determined by the oxidation of polyphenolic substances in grapes. These processes are catalyzed by oxidative enzymes such as polyphenol oxidase (PFO), laccase, tyrosinase, and during the formation of wines, by transitional metal compounds with variable degrees of oxidation (Fe, Cu, Mn). To minimize enzymatic oxidation of white grape musts, experimental activated carbon (AC-C) obtained from peach pits was studied. The study used musts obtained from healthy grapes and grapes infected with mold from both local white grape varieties (Feteasca Regală, Viorica, Legenda) and European varieties (Sauvignon Blanc, Pinot Gris), from different geographical regions. Enzymatic activities of PFO, concentrations of polyphenolic substances, and trichromatic characteristics were monitored over time. The subsequent antioxidant protection provided by activated carbon occurs through two mechanisms: 1) reducing the content of PFO and 2) decreasing the concentration of oxidizable polyphenolic substances. For Pinot Gris grape must, both healthy and affected by Botrytis Cinerea, using the maximum allowable norm of activated carbon (according to OIV regulations) - 1 g/l - reduced the enzymatic activity of PFO by 4-5 times compared to untreated musts. For other grape varieties, the reduction in enzymatic activity was more modest. In untreated musts from healthy Pinot Gris grapes, the PFO enzymatic activity decreased by approximately 33% over a period of 168 hours, while in the case of musts from Botrytis-affected grapes, the activity remained unchanged. In all cases of applying AC-C, the chromatic parameters undergo changes due to the gradual elimination of polyphenolic substances. This can be adjusted as desired by modifying the quantities of AC-C added. Therefore, the use of activated carbons obtained from food industry waste can be an efficient option to reduce the risk of enzymatic catalyzed oxidations in the production of white wines.

Key words: white grapes, must, polyphenol oxidase, browning, activated carcoal

Achnowledgements: The research was funded by State Project 20.80009.7007.21 „Reducing the impact of chemical, toxic substances on the environment and human health through the use of absorbents and catalysts obtained from domestic raw materials" running at the Technical University of Moldova.