PINKING EFFECT IN WHITE WINES AND ITS REMOVAL WITH EXPERIMENTAL ACTIVATED CARBON AC-C

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The pinking effect of white wines, known for more than 4 decades, is associated with reductive winemaking, applied with the aim of significant decrease of the oxygen content in wines and, thereby, the unwanted oxidative processes. Oenologists also use these technologies to preserve the aromatic profile of the grapes, for superior organoleptic qualities. As a result, some wines develop a noticeable pink color at various stages of winemaking and storage, including after bottling. Until now, the mechanism of this phenomenon is not known with certainty, and winemakers combat its consequences with different methods.

Different wines and musts, overall 21, from grapes of white-European varieties (Sauvignon Blanc, Aligote, Souvignier Gris) and local, old (Feteasca Albă, Feteasca Regală) and new selection (Alb de Onițcani, Viorica) were studied. Predominant were Sauvignon Blanc wines and musts (15) that were produced industrially or experimentally, using different technologies, from raw material originating from different wine-growing areas (Codru, Valul lui Traian) from Moldova, but also from France. Separately, musts were also produced from Sauvignon Blanc grapes, with the predominance of exposure to the sun, from the shade, from clones with white and pink skin. The research was carried out using ultraviolet-visible spectrophotometry, including second-order derivatives. Isolation of the pigments was carried out by the SPE method (C18) with their recovery in methanolic solution. The experimental AC-C activated carbon of vegetable origin was provided by Laboratory of Ecological Chemistry of the Institute of Chemistry. Desorption of pigments from AC-C was facilitated by ultrasound (20 kHz). The effect of AC-C was compared with the effects of additions of SO2, PVPP, bentonite, exposure to UV light. In all samples, the usual physico-chemical parameters were determined, as well as the content of total phenolic substances (SFT), flavonoids (SFF), cinnamic (SFC), proanthocyanidins, anthocyanins. All samples were subjected to the POM-test and the Pinking-test. The chromatic parameters of the wines as such, but also before/after the pinking test, were determined according to CIELa*b*.

In the studied batch, the Total Polyphenol Index (TPI) varies from 4.27 to 9.90, total phenolic substances - from 7.9 to 173.5 mg/l (gallic acid), cinnamates - from 7.6 to 46.1 mg/l (caffeic acid). POM-test extends from 0.2 to 197.6% Pinking-test demonstrated pinking susceptibility of most samples except 4. Anthocyanin content varied between 0.1 and 2.7 mg/l (cyanidin-3-glucoside). It does not correlate with the content of proanthocyanidins (0.1-230.8 mg/l). All samples demonstrated positive values for a* (red color component) after light oxidation. Wines decolorized effectively with AC-C at moderate concentrations (up to 80 mg/l), comparable to PVPP at concentrations up to 1 g/l. SO_2 removes the effect (45 mg/l), but reversible.

In the studied wines and musts, there are no correlations between the content of putative precursors (proanthocyanidins), total phenolic substances, cinnamic phenolic substances, POM-test, on the one hand, and the content of anthocyanins and Pinking-test, on the other. This implies mechanisms of chemical formation of pigments much more complex than direct transformations of precursors. AC-C has proven to be effective in removing the consequences of the pinking phenomenon, in moderate concentrations, which do not essentially affect important organoleptic properties of wines.

Keywords: white wines, reductive winemaking, proantocianidine, pinking test, POM-test, derivative spectrophotometry, C18 SPE-extraction, SO_2, PVPP, CIELa*b*.

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