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IDENTIFICATION OF POLYPHENOLIC COMPOUNDS IN WHITE WINE AFTER TREATMENT WITH VARIOUS NATURAL ALUMINOSILICATES

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Introduction

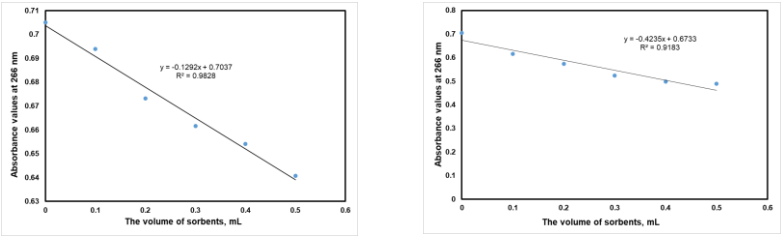
The wine industry is an important branch of the agro-industrial complex in European countries, respectively in Asia and America. Wine industry development implies the need to change traditional processes established with modern ones and the parameters for the processing and aging of wine products. Significant discussions related to the continuous improvement of technological processes and the improvement of white wine quality are important issues of Oenology globally. Wine is a complex organic material where various equilibria coexist, supported by different compounds that over time and as a result of variations in storage conditions can suffer from phenomena of protein instability. These structural changes of the protein compounds generating visual and sensory changes that can compromise the quality perceived by the consumer. Currently, the problem of stabilization of young white wines is an acute one, as there are frequent cases of colloids formation and oxidation during transport and storage. In recent years, a number of technological ways and parameters have been proposed and tested to improve oenological processes, aimed at improving wine quality. For the purpose of these determinations, an assortment of European white wine from the Sauvignon Blanc variety has been chosen. The reason for this is because it had slight changes from an organoleptic point of view (the presence of oxidation phenomenon). This type of wine has been treated with three geographical areas of clay sorbents: modified European bentonite, Asian and American cationic clays. The aim of this paper is to identify the most efficient aluminosilicate material for use in the process of protein stability and to improve or preserve bio-organic compounds specific to white wine, after performing several tests: hot stability test, oxidability and nephelometric measurements. Among the important bioorganic compounds of interest are polyphenolic groups, because they are responsible for the nuances and aromas of wine. Other characteristics of these compounds are: protein coagulation, reducing character, has bactericidal property.

Materials and methods

Sauvignon Blanc wine has been obtained through white wine specific technological processes, that are in accordance the international standards and recommended by the OIV (International Organization of Vine and Wine). The chosen wine has been treated with clay solutions of 5% concentration and in various quantities. The aluminosilicate materials added to the wine samples were of three geographical areas: two of them (Asian and American bentonites) were raw, and the European bentonite was modified by the cation exchange process with sodium ions-on layers, resulting three other types of cationic clays. The purpose of modifying this clay is to follow which layer is optimal in order to stabilize white wine in general. The protein stability test was performed at a temperature of 80^{o}C for one hour, and the oxidation test by POM method, under the working conditions specified in the literature. Meanwhile, the extracted wine samples were measured nephelometrically using a turbidimeter, pH and electrical conductivity.

Results and conclusions

After the protein stability test, the samples of wine treated with different clay solutions were filtered and analyzed spectrophotometrically in the ultraviolet range in order to determine the levels of proteins and polyphenols. After determining the protein content of all samples analyzed in the range of 250-400 nm, a maximum absorption at the wavelength of 266 nm was found. At this wavelength, the effect of each clay material added to Sauvignon Blanc wine in certain concentrations (0.1-0.5mL clay solution / 10 mL wine sample) was highlighted.



A. **B.**

Fig.1. Maximum adsorption at 266nm wavelength after treatment of Sauvignon Blanc wine with European bentonite clay first layer-A and American bentonite clay-B solutions (0.1-0.5mL)

Figures 1A and 1B show the effect between two types of clay from different geographical areas, as a comparison: modified European sodium bentonite (first layer) with the American one. The two graphs show that the modified clay sample is much more efficient than the commercial one and the higher the amount of clay sorbent in the wine (0.4-0.5mL clay solution) the higher the retention of proteins responsible for the wine turbidity. The same result was recorded for the total polyphenolic-IPT level, identified at 280nm.