

CHARACTERIZATION OF THE MANNOPROTEIN EXTRACTS OBTAINED FROM WINE INDUSTRY WASTE

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Currently, special attention within the scientific research is paid to the utilization of the waste from industrial production. In the Republic of Moldova of a particular interest is the utilization of the great quantities of the yeast sediments left after the wine production. The relevance of this direction is conditioned by the need to solve the problem of the discarded waste that damages the environment [2], and by the possibility of obtaining yeast extracts of a high biotechnological value. The mannoproteins are an important component in the structure of the yeast cell wall, and, their molecular and structural properties make them attractive for application in the agriculture, especially in the animal husbandry, food, cosmetic and wine industries. Thus, the aim of the study was to characterize the mannoprotein extracts obtained from the waste products of the wine industry.

The yeast sediments from production of the dry white wine *Rkatsiteli* (SAR), as well as the red *Merlot* (SRM) and *Cabernet* (SRC) wines by the Cricova winery, were used as the research material. Autolysis of the yeast biomass was performed by using 3% acetic acid at the temperature of +55°C for 8 hours, sodium phosphate buffer at the temperature of +45°C for 8 hours, and homogenization for 10 minutes with subsequent storage at the temperature of +45°C for 8 hours. Alkaline mannoprotein extracts were obtained according to the method [1].

For the characterization of the obtained mannoprotein extracts, the biochemical composition and the activity of the antioxidant enzymes catalase and superoxide dismutase were determined. It was established that the protein content of the mannoprotein extracts prevailed over the carbohydrate content, regardless of the autolysis method used. Thus, carbohydrates varied within the limits of 11.1±0.2-47.9±0.2% (d.w.), and the protein content oscillated between 20.9±0.27 and 65.9±3.9% (d.w.), minimum values being established in the extracts obtained from the SAR biomass. Maximum values of the protein and carbohydrate contents were obtained in the experimental variants autolyzed with sodium phosphate buffer solution at the temperature of +45°C, for 8 hours. The study of the enzymatic activity showed that the activity of catalase-type enzymes varied within the limits of 402.3±1.89-842.6±5.2 mmol/min./mg protein and the SOD activity was within the limits of 47.3±0.11-120.9±0.04 U/mg protein. The mannoprotein content, related to the absolutely dry biomass, varied within the limits of 17.9-43.2% with the maximum values established in the extracts obtained from the SRM biomass with the use of sodium phosphate buffer solution for the induction of autolysis.

The obtained results indicate that the use of biomass from the SRM wine sediments and the autolysis by sodium phosphate buffer solution at +45°C for 8 hours permitted to obtain mannoprotein extracts of a higher biochemical composition and enzymatic activity as compared to the other studied experimental variants.

References:

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