PROSPECTS FOR THE USE OF AGRICULTURAL WASTE AS A SUBSTRATE FOR ACETIC FERMENTATION

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Vinegar production in the Republic of Moldova is small compared to countries such as Italy, Spain and Asian countries, although the process of production and preparation of vinegar is now becoming more and more important. The Republic of Moldova has a great potential of agro-food products for the production of high-quality fruit vinegar. In this work, we investigated the possibility of using agro waste, such as grape pomace, walnut and hazelnut shells, apple woods chips, as a substrate for plantations and the development of acetic acid bacteria. The substrates were pre-dried in an industrial drying oven at a temperature of 32±1°C for 48 h, but for grape pomace, drying was continued until a MC 8-10±1% was reached. As a liquid part, a local white wine of increased acidity with physical and chemical indicators was used: alcohol-12.7%, sucrose-4.4g/L, pH-3.64. The concentration of alcohol is reduced by drinking water to 10%. Before using agro waste as a surface source for the development of vinegar bacteria, they were introduced into a starter culture consisting of untreated white vinegar in a ratio of 1:4. The samples were left for 72 h at a temperature of 25±1°C solid substrate. The method of direct inoculation on solid RAE medium confirmed a decrease in the number of colonies after exposure of the substrate in vinegar. During the acetic fermentation for one month, such values as total titratable acidity, pH, density was monitored. The ATT after a month of fermentation in the sample without pomace was only 3.08%, while the sample with pomace reached 8.04%, i.e. 3 times more. In the sample with walnut and hazelnut shells, the obtained indicators were slightly behind the marc, but the chromatic parameters of the wine before and after the fermentation process, judging by the results of SIELAB and spectrophotometry, were much better. Based on the results obtained, it can be concluded that the use of agro substrate has a positive effect on the fermentation rate and thereby reduces the time for obtaining wine vinegar. This is due to an increase in the contact area of the product with acetic acid bacteria that have settled on the surface of the substrate. The use of grape cake also provides the necessary nutrients for the normal functioning of acetic acid bacteria, and the walnut shell improves the organoleptic characteristics of the finished product.

Keywords: acetic fermentation, wine vinegar, substrate, peel, pomace.

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