

GRAPE POMACE AS A FILLER IN WINE VINEGAR FERMENTATION

<https://doi.org/10.52757/imb21.008>

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The wine sector in the Republic of Moldova has registered substantial increases in recent years. Viticulture and wine are a business card of our country, internationally recognized. Annually the reports show the processing of around 260 tons of grapes, which indicates that it remains a large source of by-products that must be capitalized.

Wine and vinegar can be easily differentiated in the Republic of Moldova that traditionally produce both products, as the names are well consolidated with a precise meaning. Wine has a minimum content of acetic acid of 1.2 g/L and a maximum ethanol content of 9-15 %. Vinegar has a minimum titratable acidity of 6 % and a maximum residual ethanol content of 1.5 %. Vinegar is the product obtained exclusively through biotechnological processes such as double fermentation: alcoholic and acetic fermentation of the liquid. There are various types of vinegars obtained from various sources such as fruit peels and berry, cider, malt, honey et al. Vinegar production from local agricultural sources has economic benefits, such as the promotion of local human resources and raw materials. The critical steps in vinegar production include raw material preparation and fermentation. Fruits generally require fewer treatments than cereals. Transportation and storage are difficult for perishable fruits with high water content. As a result, industries should be located near raw material production sites. In this work, we investigated the possibility of using the pomace of Muscat grapes as a filler for plantation and the development of acetic acid bacteria.

Grape pomace (*Vitis vinifera* Muscat), fruit of year 2020, from Cimişlia district, Javgur winery, was dried in an industrial drying oven at a temperature of $32 \pm 1^\circ\text{C}$, for 5-6 days until the moisture level reached $8-10 \pm 1\%$. As the liquid part, a local white wine with increased acidity from the Nova variety was used, with the physico-chemical parameters: alcohol - 12.7%, sucrose-4.4%, pH-3.64 at $T=20^\circ\text{C}$. The alcohol concentration was reduced by potable water to 10%. Before using pomace as a surface source for the development of acetic bacteria, it was introduced into the leaven which consisted of untreated vinegar in the ratio 1: 4. The sample was left for 72 h, at the temperature of $25 \pm 1^\circ\text{C}$, for the planting of the solid product with the acetic bacteria from the vinegar to the maximum and for the next use of the pomace in research. Direct sowing confirmed the planting of acetic bacteria on Muscat pomace, the number of bacteria in the vinegar after use as leaven was $2 \cdot 10$ which is twice than initially.

During acetic fermentation, for one month, values such as total titratable acidity, pH, density were monitored. ATT after a month of fermentation in the sample without pomace had only 3.08% while the sample with pomace reached the value of 8.04%, i.e. by almost 3 times more. Also, the influence of pomace on the chromatic parameters of the wine before and after the fermentation process was determined.

Table 1. Chromatic parameters of the pomace sample before and after fermentation

Sample	L*	a*	b*	ΔE^*	Chroma*	Hue*	IC	Nc	
TM	Initial	17,07±0,10	6,55±0,12	10,57±0,15	41,44±0,13	5,85±0,05	1,02±0,03	0,69 ±0,01	1.96±0,01
	After fer.	18,83±0,05	7,29±0,01	11,61±0,04	39,44±0,04	6,15±0,00	1,01±0,01	2,30±0,02	0.17±0,04

L represents lightness (L = 0, black, and L = 100, colorless), a* green/red color component (a* > 0, red, and a* < 0, green), and b* blue/yellow color component (b* > 0, yellow, and b* < 0, blue). IC-colour intensity.

Based on the results obtained during the study, we can conclude that the use of pomace has a positive effect on the rate of fermentation, and thereby reduces the time of obtaining wine vinegar. This is due to an increase in the contact area of the product with acetic acid bacteria settled on the surface of the pomace, as well as due to the presence of essential nutrients for the normal functioning of acetic acid bacteria in the pomace.

The research was funded by State Project 20.80009.5107.09 “Improving of food quality and safety through biotechnology and food engineering”, running at Technical University of Moldova.