

Optimization of blend components for the production of sparkling white wines

Nicolae Taran, Olga Soldatenco*, Svetlana Stoleicova, Boris Morari, Eugenia Soldatenco

Scientific and Practical Institute of Horticulture and Food Technologies, MD-2070, Chisinau, city Codru,
Str. Vierul, 59, Republic of Moldova.

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Abstract

Currently winemaking sector highlighted the necessity of investigating and promotion of the grape varieties of new selection and classic european varieties to produce high quality sparkling wines. Therefore it was necessary to specify the optimal composition of blends based on raw white wines using classic european varieties and varieties of new selection. In this paper in capacity of blend components classical european varieties: Chardonnay, Riesling, Aligote, Sauvignon, Pinot blanc, Pinot gris and varieties of new selection: Muscat de Ialoveni, Floricica, Viorica, Hibernat were studied. It was determined, that the use of raw wines from classic european varieties and varieties of new selection as a blend component influences to different extents on the quality of the finished product.

Keywords: Sparkling wine, blend components, classic varieties, varieties of new selection.

1. Introduction

Over the past decades obvious changes in organoleptic parameters and physico-chemical composition of raw material of white wines, aimed for sparkling wines production, were remarked, due to microclimate changing in wine growing areas as result of global warming. Produced wines are characterized with higher alcohol content and deficiency of total acidity, also they lose organoleptic typicality as young fine wine, therefore is more difficult to guarantee quality of final product [1,3].

Formation of typical properties at sparkling wines production depends of a numerous factors as: ecological, paedological, climatic conditions, the physico-chemical composition of the grapes in the defined winemaking regions, technology of raw white wines production, methods of technological treatment and processing of assemblage and blends of raw white wines and their physical-chemical

composition and biocatalytic properties of used yeast strains, secondary fermentation etc. [1,3].

Therefore, for satisfaction of customer demand appears the necessity to diversify and improve quality of produced white sparkling wines, also is need to study the potential of use of new selection vine varieties as blending partners at white sparkling wines production. For this purpose is necessary to ensure that obtained blends will provide production of new original and high quality sparkling wines, highly competitive on national and external wine market [1, 2, 3].

2. Materials and methods

The research was conducted in the laboratory of "Biotechnology and Microbiology of Wine" and section of "Microvinification" from Scientific-Practical Institute of Horticulture and Food Technologies (SPIHFT).

As objects of research the dry white wines produced from different new selection varieties of SPIHFT (Viorica, Floricica, Muscat de Ialoveni, Hiberna) and white european varieties (Chardonnay, Aligote, Riesling, Sauvignon, Pinot gris, Pinot blanc), coupages of different raw material white wines, various yeast strains from the collection of microorganisms of SPIHFT and other winemaking materials were used.

In this research work physico-chemical methods of analysis recommended by the International Organization of Vine and Wine and those elaborated or modified at the SPIHFT were applied.

3. Results and discussions

For achieving the main objectives of optimization of blending components for white sparkling wine production, experience was performed in the following directions:

1. Production of white sparkling wines by blending of raw white wines from european varieties.
2. Production of white sparkling wines by blending of raw white wines from european and new selection varieties.

Schemes of blending with use of raw white wines european varieties:

Blend 1: Chardonnay (50%) + Pinot gris (50%);

Blend 2: Chardonnay (50%) + Pinot blanc (50%);

Blend 3: Chardonnay (50%) + Aligote (50%);

Blend 4: Pinot Gris (25%) + Pinot blanc (25%) + Aligote (50%);

Blend 5: Sauvignon (50%) + Riesling (50%);

Blend 6: Riesling (70%) + Aligote (30%);

Blend 7: Riesling (40%) + Sauvignon (40%) + Aligote (20%);

Blend 8: Riesling (40%) + Sauvignon (40%) + Chardonnay (20%);

Blend 9: Sauvignon (50%) + Chardonnay (50%).

Schemes of blending with use of raw white wines from european and new selection varieties:

Blend 10: Viorica (50%) + Chardonnay (50%);

Blend 11: Viorica (50%) + Muscat de Ialoveni (50%);

Blend 12: Floricica (50%) + Chardonnay (50%);

Blend 13: Floricica (33%) + Muscat de Ialoveni (33%) + Hiberna (33%);

Blend 14: Hiberna (50%) + Chardonnay (50%).

Analysis of physico-chemical parameters (Table 1), indicate that all produced raw white wines correspond to basic quality parameters. Alcohol content ranges from 10.1 up to 13.0% vol., in dependence of the blend composition. Mass concentration of titratable acidity, pH index and oxidation-reduction potential is within acceptable limits, for this category of wines. Mass concentrations of volatile acidity in investigated samples have values ranging within the limits set for raw white wines for sparkling wines production, and not exceed 0.7 g/dm³. The concentration of sugars in the wine also does not exceed allowable limits.

In order to appreciate the quality of the initial blends of raw material for the sparkling wines the organoleptic evaluation was carried out and the results are shown in Figure 1.

According to the organoleptic evaluation of obtained blends we can highlight blends obtained by mixing of the raw wines Riesling + Sauvignon, Riesling + Aligote and Riesling + Sauvignon + Aligote, that accumulated 7.95 points and were appreciated with balanced, typical taste and with floral nuances in aroma. And the lowest marks have obtained blends produced from Pinot Blanc + Pinot Gris + Aligote, Chardonnay + Pinot Gris and Chardonnay + Sauvignon, but all blends have accumulated enough points and can be used for production of white sparkling classic wines.

In order to appreciate the potential of new selection varieties for use in the production of white sparkling wines five blends in combination with european varieties were formed. The obtained results of the physico-chemical parameters are presented in Table 2.

Analyzing the results from Table 2 we can conclude that coupages obtained by blending of raw wines produced in base of new selection varieties with raw wines from european varieties, are high qualitative which is confirmed by physico -chemical indices.

Alcoholic concentration in obtained wine varies depending on the blend composition. Blend 14 (Hibernal + Chardonnay) is characterized by increased alcohol concentration 13.0% vol. and the lowest value of this parameter is observed in blend 11 with 10.8% vol. of alcohol.

Concentration of titratable acidity also varies in depending of the blend composition and ranges from 6.5 g/dm³ up to 7.8 g/dm³. Mass concentrations of volatile acidity have values that vary in the limits for raw white wines for sparkling wines production and don't exceed 0.7 g/dm³.

Table 1. Physicochemical indices of wines obtained by blending of raw white wines from european varieties (h.y. 2012)

Name	Alcohol content, % vol.	Total acidity, g/dm ³	Volatile acidity, g/dm ³	pH	OR, mV	Reducing sugar, g/dm ³	Reducing extract, g/dm ³	Organoleptic note, points
Blend 1	13,0	5,3	0,66	3,2	217	2,8	16,5	7,85
Blend 2	12,4	5,6	0,66	3,13	220	2,4	15,9	7,9
Blend 3	12,8	5,6	0,56	3,16	219	1,9	16,6	7,90
Blend 4	11,9	6,1	0,59	3,06	225	1,6	16,9	7,85
Blend 5	11,2	6,8	0,53	2,9	234	1,2	17,1	7,95
Blend 6	10,9	7,6	0,63	2,87	236	1,3	17,2	7,95
Blend 7	10,1	6,8	0,53	2,93	233	1,2	16,2	7,95
Blend 8	11,7	6,4	0,66	3,01	228	1,9	16,4	7,90
Blend 9	12,4	5,5	0,53	3,2	216	3,3	16,3	7,85

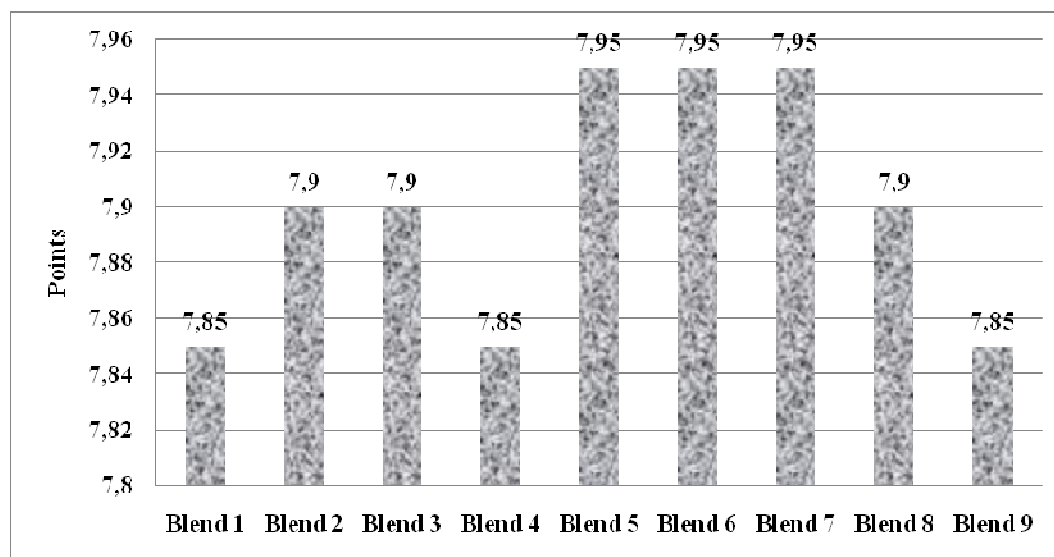


Figure 1. Organoleptic evaluation of blends obtained from raw white wines from european varieties.

Table 2. Physico-chemical and organoleptic indices of blends obtained by mixing of white wines from european varieties and new selection varieties

Name	Alcohol, % vol.	Total acidity, g/L	Volatile acidity, g/L	pH	OR, mV	Reducing sugar, g/L	Reducing extract, g/L	Organoleptic note, points
Blend 10	12,3	6,5	0,53	3,04	226	3,8	16,3	8,0
Blend 11	10,8	7,4	0,60	2,79	241	1,5	19,1	7,95
Blend 12	12,6	7,1	0,60	2,99	229	4,0	16,3	7,9
Blend 13	11,7	7,8	0,59	2,86	237	1,6	19,5	7,95
Blend 14	13,0	6,5	0,66	3,14	228	2,4	16,4	7,90

Organoleptic evaluation of obtained wines allows to highlight wines produced in base of Viorica, Floricica and Muscat de Ialoveni varieties which were used as partners in blends 10, 11 and 13 and have accumulated the highest organoleptic notes. Generally all blends of wines were rated as qualitative, and correspond to the basic technical requirements and can be used in white sparkling wines production.

4. Conclusion

After technological, physical-chemical and organoleptic appreciation of optimal blends composition were highlighted blends 5,6,7 produced from raw wines in base of european varieties and blends 10,11,13 obtained by mixing wines from european varieties with new selection varieties elaborated at SPIHFT and can be recommended for production of high quality white sparkling wines.

Compliance with Ethics Requirements: Authors declare that they respect the journal's ethics requirements. Authors declare that they have no conflict of interest and all procedures involving human and/or animal subjects (if exists) respect the specific regulations and standards.

References

1. Taran, N.; Soldatenco, E., *Tehnologia vinurilor spumante. Aspecte moderne*, Chisinau, 2011, pp. 302
2. Dumanov, V., Compoziția chimică a vinurilor albe obținute din soiurile noi de selecție autohtonă Viorica și Legenda, *Pomiculture, viticulture and winemaking* **2012**, 6, 16-17
3. Taran, N.; Soldatenco, E., et al. Study of new selection varieties for sparkling wine production, *Scientific-practical conference with international participation "Wine of the III millennium-current issues in winemaking"* 2011, Chisinau, 11-115.