TANNIN CORRECTION USED FOR OBTAINING WINES FROM IAŞI VINEYARD

CORECŢIA CONŢINUTULUI DE TANIN UTILIZATĂ LA OBŢINEREA VINURILOR DIN PODGORIA IAŞI

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Abstract. *Tannins have an important role in defining wines quality. They are responsible for astringency, slightly bitter taste and phenolate character of the wine. The tannin give the stability and the antioxidant activity of wine. If their quantity is too low, the wine is disharmonious, vulnerable to micro-organisms, low resistance storage.The corrections with tannins are often used to obtain white wines and red wines too. In this study the tannin it has been added to the must and wine at the Aligote variety. After applying these corrections it have been made a series of determinations such as: physical-chemical parameters, IFC, D280, Cielab, total tannins by Bate-Smith method with methyl cellulose, to see the influence of these corrections on the existing quantity value of tannin in wines.*

Keywords: tannins, phenolic compounds, astringency;

Rezumat.*Taninurile au un rol important îndefinirea calităţii vinurilor. Ele sunt responsabile de astringenţă, gustul uşor amar şi caracterul fenolat al vinului, conferind stabilitate şi activitate antioxidantă. Insuficienţa lor face ca vinul să fie nearmonios, vulnerabil la microorganism şi slab rezistent la păstrare. Corecţiile de compoziţie cu taninuri sunt frecvent utilizate atât la obţinerea vinurilor albe, dar şi cele roşii. În cadrul acestui studiu s-au realizat adaosuri de taninuri la vinuri albe atât la must cât şi la vinul din soiulAligote. După aplicarea acestor corecţii s-au efectuat o serie de determinări cum sunt: parametrii fizico-chimici, IFC, D280, Cielab, determinarea cantităţii totale de tannin prin metoda Bate-Smith cu metilceluloză, pentru a vizualiza influenţa acestor corecţii şi valoarea cantitativă de tannin existent în vinuri.*

Cuvintecheie: tanin, compuşi fenolici, astringenţă;

INTRODUCTION

Tannins corrections are usually applied in wines already finished, but can also be applied to musts, giving them, among astringency also a velvety taste, stability and antioxidant protection. Tannins corrections are done at the moment when the musts or wines have an insufficient quantity of tanant substances, which is due to lack of full maturity or the stopping of the maceration process because of different reasons as: spoiled harvests with molds (Cotea D.V. 2009, Cotea V.V., 2006). In the production of white wines, it is recommended that tannins be used in

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combination with potassium metabisulphite in order to prevent malolactic fermentation and to ensure an antioxidant protection (Gayon 2006, Cotea 1985).

Tannins addition is necessary due to many reasons as color stabilisation, increasing the ageing potential, adjuvant to protein precipitation and wine stabilisation, inhibition of lacase activity, being also a medium for micro-oxigenation (Keulder D.B., 2006, Croitoru C., 2009) and acting as a redox buffer.

MATERIAL AND METHOD

For this study, correction of tannins at must and wine from the Aligoté grape variety, harvested from V. Adamachi farm, Iași, were used. The additions were made according to technological instructions of the producing company Sodinal. The wines used for correcting were obtained by applying specific technologies for white wines production. 3 variants were realised, treated with three types of tannins: V1-Noxitan, V2- Taniblanc and V3- ProtanPepin, applied both to must and wine.

After the wine samples were obtained, a series of analytical analysis were made, such as: physical-chemical analyses, color determination using Cielab 76, total poliphenolic index (IPT) or D280, determination of total tannins by Bate-Smith method with methyl cellulose and Folin-Ciocâlteu index, specific to phenolic compounds with reductive properties. Analyses were realised according to OIV standards.

RESULTS AND DISCUSSIONS

After the analysis of the physical-chemical parameters of the Aligoté wines, to which tannins were added in the must (table 1), it was registered that the specific values do not have major variations.

Table 1

Physical-chemical characteristics of Aligoté wines, after tannin corrections in must

Sample	Alcoholic conc. % vol.	Total acidity. g/L $C_4H_6O_6$	Volatile acidity .g/L $C_2H_4O_2$	Relative density	pH	Cond. μS	Reductive sugars g/L	E.S.T g/L	E.S.N g/L
Cont	11,05	7,00	0,32	0,99410	3,12	1675	2,20	22,90	20,70
V1	11,02	7,10	0,29	0,99450	3,12	1656	3,05	23,70	20,65
V2	11,07	7,22	0,31	0,99480	3,12	1670	1,86	24,80	22,94
V3	11,05	7,15	0,30	0,99450	3,12	1672	2,20	24,20	22,00

V1- Noxitan; V2- Taniblanc; V3- ProtanPepin – correction of tannin content in must;

Slight fluctuations were noticed at the alcoholic concentrations between 11,02, in the case of sample V1 and 11,07 at sample V2. Total acidity has values between 7,00 (control sample) and 7,22 g/L $C_4H_6O_6$ (V2), fact that confirms that tannins slightly change the wine's acidity. Regarding density, in the samples where an increase in tannins addition was used, its specific values also grew compared to the control, between 0,9945 and 0,9948. The reductive sugars

content is low, the wines being dry. The non-reductive dry extract varies from 20,70 g/L in the case of the control sample up to 22 g/L in the case of the sample whereProtanPepin was used.

Regarding the physical-chemical analyses of the wines where tannins correction were done after the alcoholic fermentation, the constant of the alcoholic concentration is observed as well as small changes in the total acidity: 0,08 units in V1, 0,01 in V2 and 0,03 in V3. The relative density has small fluctuations, while the non-reductive dry extract has values between 18,02 in the control and 8,83 g/L in V3′ (table 2).

<div align="right">Table 2</div>

Physical-chemical characteristics of Aligoté wines, after tannin corrections in wine

Sample	Alcoholic conc. % vol.	Total acidity. g/L $C_4H_6O_6$	Volatile acidity .g/L C_2H_4	Relative density	pH	Cond. µS	Reductive sugars g/L	E.S.T g/L	E.S.N g/L
Contr	11,47	6,83	0,29	0,99210	3,13	1544	0,97	19,00	18,02
V1'	11,47	6,91	0,27	0,99220	3,11	1544	0,97	19,30	18,33
V2'	11,47	6,84	0,28	0,99228	3,12	1544	0,97	19,60	18.63
V3'	11,47	6,86	0,28	0,99236	3,12	1544	0,97	19,80	18,83

V1 - Noxitan; V2 - Taniblanc; V3 - ProtanPepin correction of tannin content in wine;

Table 3 presents the quantitative values of epicatechin equivalent in mg/L in the wines where the tannins corrections were done before the alcoholic fermentation and after the alcoholic fermentation.

<div align="right">Table 3</div>

Values of total tannins obtained with the Bate-Smith method with methyl cellulose

Sample	Abs. control sample	Abs. MC sample	Absorbency	Epicatechin equivalent mg/L	Austral curve
Control	1,7600	1,6020	0,1580	30,09	23,00
V1	2,4726	2,4353	0,0373	33,88	3,53
V2	2,2496	2,2068	0,0428	59,76	4,42
V3	2,3403	2,2969	0,0434	62,59	4,52
Control′	2,9680	2,9311	0,0369	32,00	3,47
V1'	3,1779	2,9877	0,1902	37,67	28,19
V2'	2,9411	2,6606	0,2805	58,92	42,76
V3'	3,0901	3,0448	0,0453	71,53	101,27

Significant values are present in V3 and V2, of 62,59 and 59,76 mg/L, while in V1 the The lowest quantity of tannins is found, of 33,88 mg/L, due to the potassium metabisulphite found in the used Noxitan product. Regarding the wine

samples where tannin treatment was done after the alcoholic fermentation, the tannins quantity was quoted in epicatechin equivalent and is slightly higher than the one found in the wine samples treated before the alcoholic fermentation. The values are between 37,6 mg/L in V1′ and 71,53 in V3′. Tannins addition after the alcoholic fermentation is used when a certain quantity of tannins is wanted, but when tannins correction is done before the alcoholic fermentation leads to the obtaining of a more harmonious and well-defined wine.

The chromatic parameters of wines where tannins corrections were done before and after the alcoholic fermentation can be found in table 4. Parameter **L** is very close to 100, which proves that the wines are white, very light in color. Parameter a has negative values, proving the lack of red and green compounds, while parameter b proves the existence of yellow compounds. The values vary according to the type of tannin used, with a maximum in V3 and V3′ , namely 3,7230 and 4,2980. The chroma fluctuates in the same direction as the presence of yellow compounds, with minimal values in V1 and V1′.

Table 4

Chromatic parameters ofAligoté wines

Sample 2010	Luminosity L	Chromaticy		Chroma C	Tonality H	Luminosity	Hue
		a	b				
Martor	99,7323	-0,2926	1,3979	1,4282	-78,1770	0,0263	6,0612
V1	99,5962	-0,3167	1,9406	1,9662	-80,7287	0,0365	5,3137
V2	99,4780	-0,3278	2,0594	2,0853	-80,9534	0,0431	4,6538
V3	99,3972	-0,3411	2,3048	2,3300	-81,5814	0,0476	4,4829
Martor′	98,7590	-0,6571	3,7230	3,7806	-79,9903	0,0848	3,7404
V1'	98,7887	-0,5567	3,7604	3,8014	-81,5786	0,0825	3,8088
V2'	98,5802	-0,0955	4,9152	4,9162	-88,8868	0,0982	3,2062
V3'	99,0198	-0,6667	4,2980	4,3494	-81,1830	0,0797	4,6534

Figure 1 presents the D280 index and the FolinCiocâlteu index, specific only for phenolic compounds with reductive properties. The values are specific for white wines and vary according to the type of tannin used. Therefore, the wine sample treated with Noxitan, the values are the lowest, namely 2,98 and 3,30, while the samples obtained with Taniblanc and ProtanPepin, the phenolic compounds have slightly higher values, namely 4,95 and 5,33.

Figures 2 and 3 represent the graphics of sensorial analyses of the wines where tannin corrections were used in must and in wine. In the first case, samples V1, V2 and V3, the sensorial characteristics are superior to those of the control sample, the obtained wines being more astringent and harmonic. Samples V1′, V2′ and V3′, the values of the descriptors are higher than those of the control sample, the obtained wines having a more pronounced astringency and a bitter note.
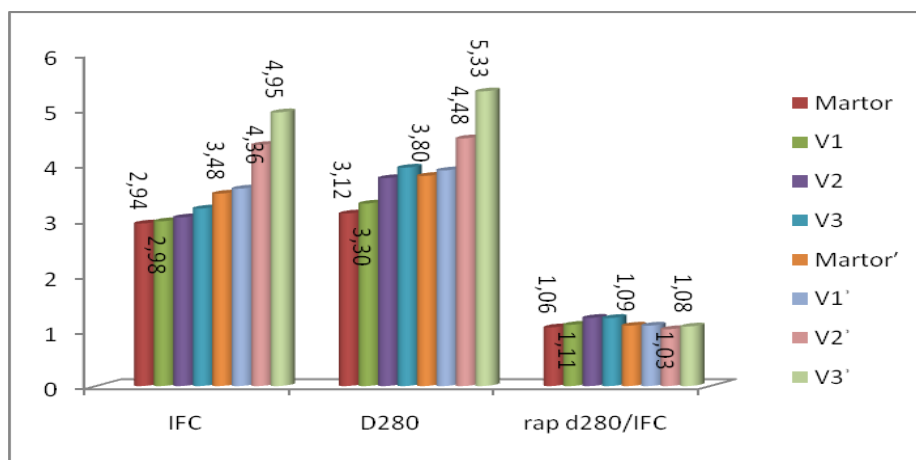
Fig.1- Variation of indexes IFC and D_{280} and their ratio in Aligoté wines
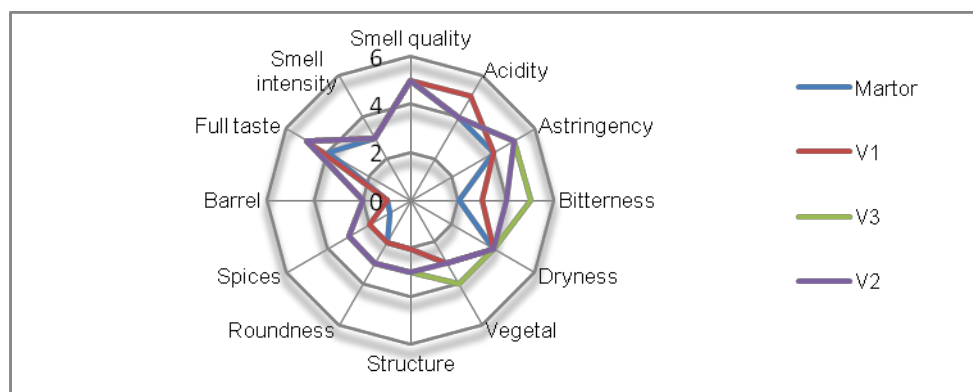
Fig. 2- Sensorial characteristics of Aligoté wines obtained through tannin addition in must
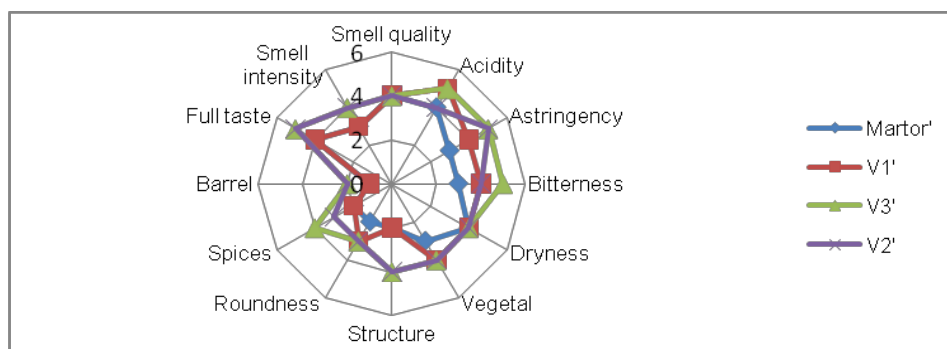
Fig. 3 -Sensorial characteristics of Aligoté wines obtained through tannins addition in wine

CONCLUSIONS

1. The total tannin quantity has significant values in the case of the samples treated with ProtanPepin and Taniblanc.

2. The color parameters vary according to the used tannin, while parameter b has higher values in the wine samples where tannins were added.

3. Total phenolic compounds present higher values in samples with tannin addition, while the values of the Folin-Ciocâlteu index grow according to the type of tannins used.

4. The treated wines have superior sensorial characteristics compared to the control samples, the tannins having a positive influence on wine's quality.

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