

OBTAINING AND CHARACTERIZATION OF SOME FLAVOURED TYPES OF WINE FROM WHITE GRAPES - RIESLING ITALIAN

OBȚINEREA ȘI CARACTERIZAREA UNOR SORTIMENTE DE VINURI AROMATIZATE DIN STRUGURI ALBI - RIESLING ITALIAN

POIANĂ MARIANA-ATENA

Faculty of Food Processing Technology, Banat's University of Agricultural Sciences
and Veterinary Medicine

Abstract. *This paper presents the obtaining of two types of flavoured wines start to white grape – variety Italian Riesling, from Recas vineyard, situated in the west part of Romania, in the viticultural Banat region. It was restored the most important steps followed: the must obtaining and its alcoholic fermentation, the characterization of resulted wine, the preparation of macerates used for flavouring, the obtaining of flavoured wines and their physico-chemical characterization. The flavoured wines are special ones prepared from wine, sugar and plants extracts. It was obtained two flavoured wine types with alcoholic degree 18% vol., the sugar content 100 g/l and total acidity 4g/l H₂SO₄. The other characteristics (dry total extract, reduced extract, the color) are distinct in accordance with the macerate used for flavouring.*

Rezumat. *Lucrarea prezintă obținerea a două sortimente de vinuri aromatizate pornind de la struguri albi - soiul Riesling Italian, prelevați din podgoria Receaș, situată în vestul României, în Regiunea viticolă Dealurile Banatului. Sunt prezentate detaliat cele mai importante etape parcurse: obținerea mustului și fermentația alcoolică a acestuia, caracterizarea vinului de bază, obținerea maceratelor utilizate pentru aromatizare, prepararea vinurilor aromatizate și caracterizarea fizico-chimică a acestora.. S-au obținut două sortimente de vinuri aromatizate cu tăria alcoolică de 18% vol., conținutul de zahăr 100 g/l, aciditatea totală 4g/l H₂SO₄. Celelalte caracteristici (extractul sec total, extractul sec nereducător, cenușa, culoarea) sunt distincte în funcție de maceratul utilizat pentru aromatizare.*

INTRODUCTION

Lately, it's important to produce new kinds of special wines. From this category, aromatic wines take an important place because of the alcoholic degree and great amount of sugar. These qualities give them a good preservation.

Aromatic wines are special ones prepared from wine, sugar and plants` extracts for their preparation the first step is preparing plants` macerated (alcoholic solution and sugar syrup).

Sugar syrup is prepared at cold temperature in wine, proportion 1:1 or in water at hot temperature. Sugar concentration of syrup is made by refractometer.

Calculations of the materials is made on recipe the main compounds being refined alcohol and sugar. The final step is verifying the acidity of the mixture and acidity correction with citric acid [2,4].

The wines flavouring can be making by infusion procedure or by using the alcoholic macerates from different parts of plant acid [4].

In this paper it was used the second procedure because to it simplicity and obtaining of some products with constant organoleptical and physico-chemical characteristics.

MATERIALS AND METHODS

In order to obtain the main wine which must be aromatized it were used grapes from Italian Riesling kind from harvest 2004, from Recas wineryard.

For grapes, it was determined some index which give us information on raw material that influence the quality of must and wine [1, 3].

Table 1

Uvological index of grapes	
Uvological index	Riesling grapes
Structure index of grape	21.84
Beans index	72
Structure index of bean	7.31
Efficiency index	4.51

The process of must obtaining is: the separation of beans, crashing the beans, draining the must, pressing the tescovine, and evacuation of it and collect of the rest of must, clarifying the must by maintaining it over the night at temperature of 8-10°C and the separation of impurities from the bottom of the recipient [5].

The obtained must was sulfated with sulfurous anhydride in dose of 50 mg/l. also, in this stage it takes samples for determination of acidity and amount of reducing sugar. Obtained values were: the amount of sugar from grapes 195.2 g/l; acidity 5.12 g/l in H₂SO₄; density 1.082g/cm³.

The juice obtained was used in order to obtain wine. For this it was fermented in small recipients with fermentation funnel.

The fermentation was spontaneous under influence of grapes microflora; the fermentation process was for 12 days.

At the end of this period we obtained a dry white wine (2.7 g/l sugar).

The obtaining of macerates used for wine aromatization:

It were obtained two macerated from a plants mixture (5 g peppermint, 5 g hiprose; 1.5 g lemon skin; 0.5 g cinnamon and 2.5 g clove) by the following procedure: a volume of 100 ml alcohol 45% vol. is added and the hole mixture is macerated for 20 and 40 days; after this period the macerated (MI after 20 days and MII after 40 days) is separated from plants mixture, then the plants mixture is pressed, the two fractions are gathered and they are used for wine flavoring.

The obtaining of flavoured wines:

From the base wine Riesling it was obtained 1l flavoured wine with 18% vol alcohol, sugar 100g/l and total acidity 4,0 g/l H₂SO₄. Materials calculation is in account with make recipe, on the base of total and partial balance sheet of main compounds: refined alcohol and sugar .

The balance equations (1), (2) and (3) are:

(1) Total balance sheet equation:

$$V + M + A_r + S = VS$$

(2) Partial balance sheet equation in sugar:

$$800 \times S = 100 \times 1000$$

(3) Partial balance sheet equation in alcohol:

$$11.5 \times V + 20 \times 45 + 96 \times A_r = 18 \times 1000$$

where:

- V - Volume of Riesling wine (ml);
- M - Volume of macerate (ml); The macerate represent 2% from flavored wine's volume (M=20 ml);
- A_r - Volume of refined alcohol (ml);
- S - Volume of syrup (sugar solved in water);
- VS - Volume of flavored wine (1000 ml).

$$V + A_r + S = 980$$

S=125 ml syrup with 800g/l sugar (100 g sugar and 62.89 ml bidistilled water, because the sugar density is 1.61 g/ml)

$$V + A_r = 980 - 125 = 855$$

$$11.5 \times V + 96 \times A_r + 45 \times 20 = 18 \times 1000$$

$$11.5 \times V + 96 \times A_r = 17100$$

In this equation 11.5% vol. is alcoholic degree of Riesling wine (see the table 2), 45% vol is alcoholic degree of macerate and 18% is alcoholic degree of flavored wine.

A_r=90 ml refined alcohol (96%vol alc.)

V=765 ml Riesling wine

The recipe used is:

- 765 ml white wine Riesling with 11,5% vol. alcohol and acidity 3.95 g/l H₂SO₄
- 90 ml alcohol of 96%vol. alcohol;
- 125 ml sugar sirop (100 g sugar and 62.89 ml bidistilled water);
- 20 ml macerate;

In the end it was calculated the citric acid needed for acidity correction (to the final value 4.0 g/l H₂SO₄):

$$765 \times 3.95 = X \times 1000$$

$$X = 3.02 \text{ g/l H}_2\text{SO}_4$$

$$M_{\text{acid citric hidratat}} = (4 - 3,02) \times \frac{70}{49} = 1.4 \text{ g}$$

X - the total acidity of flavoured wine before acidity correction;

3.95- the total acidity of Riesling wine (see the table 2);

4.0 the final acidity of flavoured wine;

70 - the citric acid equivalent;

49 - the H₂SO₄ equivalent.

For total acidity correction it was used the citric acid (1.4 g) beforehand dissolved in Riesling wine.

RESULTS AND DISCUSSIONS

The figures 1 and 2 show the evolution of reducing sugar content and temperature during fermentation process of must obtained from Riesling grapes.

The main characteristics for Riesling wine are presented in the table 2.

The characteristics of aromatic wines are presented in table 3 and 4 compared with initial wine - Riesling.

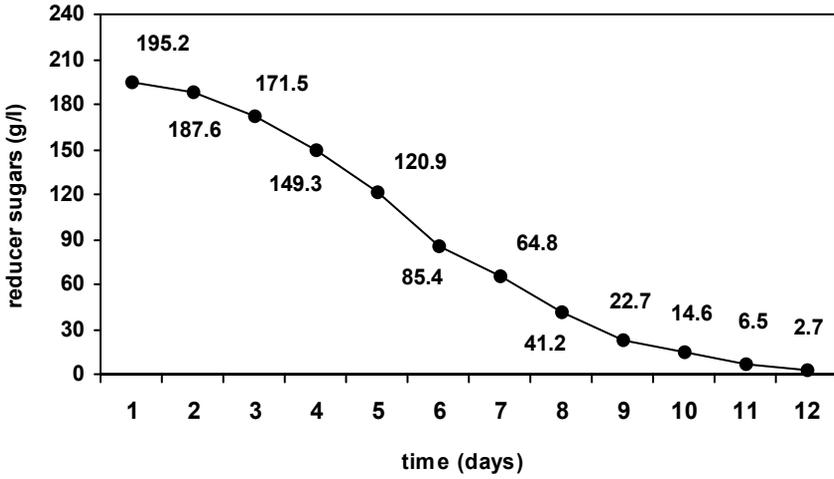


Figure 1 - The evolution of reducer sugars content in the time of alcoholic fermentation of grape juice

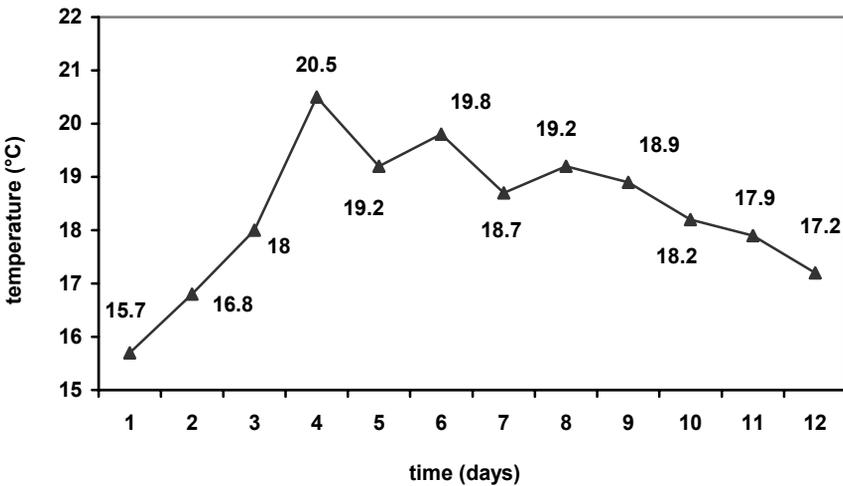


Figure 2 - The evolution of temperature during of alcoholic fermentation proces for grape juice

Table 2

The characterization of obtained white wine

The parameter	The white wine Riesling
Total acidity (g/l in H ₂ SO ₄)	3,95
Volatile acidity (g/l in CH ₃ COOH)	0,32
Reducer sugars (g/l)	2,7
The unreduced extract (g/l)	22,31
Total alcoholic degree (% vol.)	11,5
The content of free SO ₂ (mg/l)	26,1
The content of total SO ₂ (mg/l)	115,7

Table 3

The characterization of flavoring wines from raw wine Riesling

The parameter of flavoring wines	V+MI	V+MII
Total acidity (g/l H ₂ SO ₄)	4.0	4.0
The total extract (g/l)	117.95	118.36
The unreduced extract (g/l)	17.92	18.35
Reducer sugars (g/l)	100	100
Total alcoholic degree (% vol.)	18	18

Table 4

The chromatic features of flavoring wine

Chromatic features	Raw wine Riesling	Raw wine + MI	Raw wine + MII
E _{420nm}	0.711	0.612	0.639
E _{520nm}	0.067	0.109	0.147
I= E _{420nm} +E _{520nm}	0.778	0.721	0.786
$T = \frac{E_{420nm}}{E_{520nm}}$	10.61	5.61	4.35

The results regarding the characteristics of the used grapes and the unfolding of wine making process:

1. From the table 1 we can say that the grapes Riesling presented values of uvologic index for a full maturity. Also, the must from primer vinification presented values for total acidity, reducing sugar and density which are good enough to ensure the wine parameters that place it between DOC wines.

2. The figures 1 and 2 show that the alcoholic fermentation process devolves adequate, in well conditions (temperature is lower than 21°C), because it was realized an rigorous control for temperature (the maxim values were 20-21°C).

The results regarding the chemical characteristics of the base wine:

1. Table 2 shows that base wine Riesling is dry (2,7 g/l sugar) The values of the volatile acidity lower than 0,9 g/l acetic acid shows that alcoholic fermentation it was devolved in corresponded conditions.

2. The content of free and total SO₂ was in STAS limits: 25 mg/l free SO₂ and 200 mg/l total SO₂.

3. Regarding the alcohol, total and volatile acidity and the unreduced extract the wines Riesling is DOC wine.

The results regarding flavoured wines obtained:

1. The results presented in the table 3 show that obtained wines have 18% vol alcohol and sugar content of 100 g/l and they are superior wines appetizer.

2. The values of total extract are substantially different from base wine because of the sugar used as sweeter and the specific extract for aromatisation.

3. It shows that obtaining aromatic wines, the dry extract is diminished because of the dilution of the wine (765 ml Riesling wine for 1l aromatic wine).

4. The chromatic properties of the aromatic wine are different from the base wine (table 4). The intensity of the color and the tone of the color was determined on absorption at length wave specific for yellow-orange pigments (420nm) and red ones (520nm). The yellow-orange pigments decreases for aromatic wines (the decrease is larger for aromatic wine from macerated I). Red pigments are presents in a very small amount in lease wine; the macerates addition is changing on the wine aspect because of the color of macerates used for aromatization; The modifications were in accordance to the extraction time. The tonality of the color decrease with addition of macerates

5. Aromatic wines are made under a well known recipe and are stable because of the high amount of alcohol, high amount of sugar, base wine acidity and the addition of citric acid. They have a good extractability, the color moved from yellow-gold to yellow-orange with slowly red reflexes. There weren't flaws of taste or smell.

CONCLUSIONS

The results of this study indicates that:

1. Aromatic wines have 16-18% vol. alcohol and sugar amount of 100-160 g/l which give them physico-chemical stability.
2. By aromatization, the total dry extract is decreased.
3. Chromatic properties of the aromatic wine are different from the base one. The time for macerates obtained has the influence about the chromatic properties of wine.

REFERENCES

1. **Cotea D.V., 1985** - *Treatise of Oenology*. no.1, Hause of Book Ceres, București.
2. **Poiană Mariana-Atena, 2004** - *Vegetable food technologies: methods for analysis, application and technologic calculations*. Hause of Book Eurobit, Timisoara.
3. **Pomohaci N., Gheorghită M., Cotrau A., 1990** – *Oenology*. Didactic and Pedagogic Hause of Book, Bucuresti.
4. **Pomohaci N., Namolosanu I., Namolosanu A., 2000** - *The obtaining and care of wines*. Hause of Book Ceres, București.
5. **Pomohaci N., Cotea V., Staoian V., Namolosanu I., 2001** – *Oenology*. Hause of Book Ceres Bucuresti.