OPTIMIZING THE OPERATION OF MACERATION TO OBTAIN QUALITY WHITE WINES

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Abstract: This study monitors the physico-chemical properties of wines from Dragasani under the influence of pectolytic enzymes in various temperature conditions. during maceration contact is made between the grape skins and selected the optimal time leads to wines with more pronounced floral character. The physico-chemical extraction maceration leads to a more pronounced specific compounds, the time of maceration is very important in this case. The curing time is of great importance in producing varieties Muscat Ottonel and Tămâioasă Românească primarily for successful extraction of aromatic components from grape. As noted in the literature flavored grapes contain large amounts of terpene compounds are in free form or bound. To optimize the technological process is able to extract these compounds and to achieve a harmonious and balanced wine. The variants considered in the study presents the results of physico-chemical and aromatic wines obtained from the Muscat Ottonel and Tămâioasă Românească, which took into consideration both during maceration and the use of selected yeasts and enzymes, which form the basis for the selection of the optimal procedure for obtaining aromatic white wines in Dragasani Vineyard.

Keywords: maceration, optimizing, aromatic wines, odour

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INTRODUCTION

The phenomenon of maceration aims at the extraction of flavor, phenolic resins and tinting so that it produces high quality wines. You can use the foetus maceration for all grape varieties if it seeks to follow a particular category of wine (Itu et al., 2008; Colibaba et al., 2009; Ebadi et al., 1995).

Aromatic wines, muscat type, is generally an overlap of two processes that influence each other and where the foetus maceration takes place at the same time as the alcoholic fermentation, this process is called fermentation on Meera. As it is known, the varieties of muscat contain both in the skin and in the pulp with a wide range of aromatic substances, substances which as a result of technological processes of production of wine passing into it (Colibaba et al., 2011; Colibaba et al., 2010). Terpene compounds are found in grapes, musts and wines, both in free-form, as well as combined, particularly in the form of glycosides, such as aroma precursors (Cotea et al., 2009; Țârdea, 2007). Terpene compounds may be found under different forms: aldehyde, alcoholic, acidic or in the form of esters (Cano-Lopez et al., 2010; Gunata et al., 1994; Colibaba et al., 2011; Colibaba et al., 2010). Most Monoterpenele are alcohols monoterpenic odorant, linalool, in particular that can be accumulated in quantities of the order of g/L. From this sub-class, the most odorous substances are citronellol and linalool. After De Santis et al., 2010 and Gunata et al., 1986 terpenes have a distribution that varies between 20% for nerol and 85% for hotrienol variety in the Riesling Italian skin. In their combined form we find terpenes in association with the grape sugars, these being known as glycozidic links (Colibaba et al., 2011; Colibaba et al., 2010; Lacureanu et al., 2011; Salinas et al., 2005; Cordonnier et al., 1974).

MATERIALS AND METHODS

- The influence of time and maceration enzymes of the white wines from the vineyard Drăgășani

In this study we used grape varieties from Muscat Ottonel, Tămâioasă Românească, and picked at full maturity in 2012, enzymes Sihazym Extro, www.begerow.com, selected yeasts *Saccharomyces cerevisiae* Optimum-White, www.lallemmand.com, polygalacturonase enzyme activity and β -glucosidase Sihazym A, www.begerow.com. Soaking time was 2 hours, 12 hours and 36 hours, labeled with T1, T2, T3.

Alcoholic fermentation was carried out microvinification system at a temperature of 18⁰C, or 10 days with the addition of SO₂ of 40mg/L, in the four types as follows:

Version I - musts treated enzyme spontaneously fermented

V1 - must assemble made with grapes from Muscat Ottonel, Tămâioasă Românească, spontaneous fermentation by the action of epiphytic microflora

Variant II - macerated grapes pellicular maceration, maceration enzyme-treated, spontaneously fermented mash

V2 - must treated with enzyme maceration Sihazym Extro, grape originated from Muscat Ottonel, Tămâioasă Românească, 2g/hL, spontaneous fermentation by the action of epiphytic microflora

Variant III - macerated grapes from pellicular maceration, maceration enzyme-treated, fermented with selected yeasts must

V3 - mash maceration treated with enzyme Sihazym Extro from the grapes Muscat Ottonel, Tămâioasă Românească, fermentation conducted with the addition of selected yeasts Optimum-White, 20g/hL

Variant IV - macerated grapes pellicular maceration, maceration enzyme-treated, fermented with selected yeasts must with added enzymes polygalacturonase and β -glucosidase activity

V4 - mash maceration enzyme treated Sihazym Extro Muscat grape originated Ottonel, Tămâioasă Românească, fermentation conducted with the addition of selected yeasts Optimum-White, enzymes Sihazym A 2g/hL.

The physico-chemical properties of selected wines were made after the agreed methodology OIV, as instructed from www.hannainstr.com/manuals :

- the concentration of alcohol (% v/v)
- determination of total acidity (g/L)
- determination of volatile acidity (g/L)
- determination of dry extract un-reduced (g/L)
- determination of polyphenols (mg/L),
- determination of residual sugar (g/L)

and glycerol was determined by the method R-BIOPHARM(Cat NO10148270035), (g/L)

RESULTS AND DISCUSSION

In view of the results as objective assessments, analysis was performed on white varieties Muscat Ottonel, Tămâioasă Românească, on the variants V1, V2, V3, V4 proposed. They watched indicators characterizing white wines, but they quantify and flavors substances of each variety. The physico-

chemical analysis of wines resulting four proposed variants leads to selecting the optimum processing grapes in order to get higher quality wines. *Physico-chemical and aroma of wines made from Muscat Ottonel and Tămâioasă Românească processed through four technological options.*

The curing time is of great importance in producing varieties Muscat Ottonel and Tămâioasă Românească primarily for successful extraction of aromatic components from grape. As noted in the literature flavored grapes contain large amounts of terpene compounds are in free form or bound. To optimize the technological process is able to extract these compounds and to achieve a harmonious and balanced wine. The variants considered in the study presents the results of physico-chemical and aromatic wines obtained from the Muscat Ottonel and Tămâioasă Românească, which took into consideration both during maceration and the use of selected yeasts and enzymes, which form the basis for the selection of the optimal procedure for obtaining aromatic white wines in Dragasani Vineyard.

Figure 1. Alcoholic strength of wines from the varieties Muscat Ottonel and Tămâioasă Romanian digested for 2h, 12h, 36h and fermented in four variants: V1-without added enzyme maceration, fermentation spontaneous V2-maceration with pectinolytic enzymes, fermentation spontaneous V3-maceration with pectinolytic enzymes, fermentation with selected yeasts; V4-maceration with pectinolytic enzymes, fermentation with selected yeasts, enzymes potentiation flavors glycosidic.

As shown in Figure 1 ottonel result Muscat wine by the four variables considered so the alcohol concentrations ranging from 10,2%v/v -12,5%v/v, Spontaneous fermentation is one who achieved the lowest value. Maceration time is good from 12 to 36 hours, but the lack of enzyme and yeast selected not lead to a substantial accumulation of alcohol, the amount exceeding 10,5%v/v. The V2 and V3 variants by using macerating enzymes and yeast selected to reach an alcohol concentration of 11,9%v/v, but it appears that an extended maceration is not desirable, this having an impact on the phenomenon of alcoholic fermentation strict. However if applicable variant 4 which adds enzymes polygalacturonase and β -glucosidase activity, alcohol leads to alcoholic fermentation maximum of 12,5%v/v, a maceration for 12 hours. For Tămâioasă Românească spontaneous fermentation of alcohol leads to a rate of only 9,2 %v/v, but after applying variants 3 and 4, this indicator increases reaching 11,9%v/v, respectively 12,6%v/v. The highest concentration shown in the variants V4, the leaching time is 12 hours.

For this parameter the Tămâioasă Românească variation between 9.2% v/v alcohol during maceration for 2 hours and 10.2% v/v maceration during 36 hours with spontaneous fermentation. Addition of enzymes and yeast selected in conjunction with an optimum maceration leads to the growth of the indicator to 12.6% v/v, which leads to the assumption that both time and enzyme maceration and additions have a beneficial effect on yeast on it.

A significant proportion have acids in wine. They are part of the fundamental structure of the wine, with values falling between 5-7g/L. It accumulates the largest amount of grapes, except during the alcoholic fermentation.

The total acidity as can be seen in Figure 2 is within the range of 5.6 g/L and 6.9 g/L, for Muscat Ottonel and 9.8 g/L of tartaric acid based on the time of maceration applied and study selected option. It is noted that the increased acidity of 15% Muscat Ottonel in version V4, the maceration period of 12 hours. A maceration for 36 hours, the acidity decreases slightly, probably as a result of oxidation-reduction reactions taking place. In the case of spontaneous fermentation, the acidity is between 5.6 g / l and 5.9 g / L, in this case, a longer soaking time of 36 hours favor the accumulation of carboxylic acid come. The use of pectolytic enzymes favors the accumulation of acids in an amount greater than the spontaneous fermentation, here during the maceration for 36 hours leads to values that pass 6g/L. The combination of enzyme and yeast selected acidity is favorable, the best option being considered during the maceration V3 V4 T2 and T1 during maceration, where the acidity is around 6.5 g/L.

For Tămâioasă Românească there is a much stronger increase the acidity reached values of around 8 with the addition of enzyme solution leaching and selected yeasts and 9.5 / 9.8 for the solution added to the end of the alcoholic fermentation and enzyme glycosidic. As long maceration there is an optimum value of 2 to 12 hours, and as processing variant would recommend the V2/V3, the idea of a balanced acidity. For V4 version is advised regarding any changes in aggregate with maceration times selecting other types of enzymes and yeasts.

Figure 2. The total acidity of wines from the varieties Muscat Ottonel and Tămâioasă Românească soak for 2 hours, 12h, 36h and fermented by the four variants: V1-without the addition of maceration enzymes, spontaneous fermentation; -Maceration with spontaneous fermentation, pectolytic enzymes; V3-maceration with pectolytic enzymes, fermentation with selected yeasts; V4-maceration with pectolytic enzymes, fermentation with selected yeasts, potentiation flavors with glycosidic enzymes

An important indicator is the volatile acidity (Figure 3), expressed in acetic acid content, an index which does not exceed a values greater than 1.2 g/L. As a result of variations in question is observed in Figure 3 that this indicator falls within the limitations imposed only if it is used in the process of maceration enzymes and fermentation of selected yeasts. Even though the grapes are macerated, operation in the three variants of the time, this shall

not lead to harmonisation of volatile acidity, it lists values that exceed the maximums permitted by 25%. Therefore it is recommended to use a fermentation maceration optimal solution is found in V4 at times T1, T2. As noted in Figure 3 and V3 version requires volatile acidity acceptable, even if higher than V4 variants approximately 9-10%. Spontaneous fermentation, even if involves different maceration time does not diminish the volatile acidity, this hovering between 1,6g/L and 1,8g/L. It appears that even this indicator increases with increasing maceration time from 2 hours to 36 hours. For Tămâioasă Românească volatile acidity is observed that the values below 1 even longer maceration variants. These values can be found from 0.4 to 0.9 g/L acetic acid, and the leaching time 36 hours results in a corresponding increase.

Figure 3. volatile acidity of wine derived from varieties Tămâioasă Românească Muscat Ottonel and macerated for 2 h, 12 h, 36h and fermented through the four variants: V1-without the addition of maceration enzymes, spontaneous fermentation; -Maceration with spontaneous fermentation, pectolytic enzymes; V3-maceration with pectolytic enzymes, fermentation with selected yeasts; V4-maceration with pectolytic enzymes, fermentation with selected yeasts, potentiating flavors with glycozidic enzymes

Unreduced dry extract is a very important in determining the quality of the wine category, expressing also the potential variety and the vineyard. This indicator can control the naturalness and authenticity of wine. The results are

presented in Figure 4. Muscat Ottonel variety for the spontaneous fermentation with maceration 2 hours drive to obtain a value to obtain sec 14, 5 gVL, 12 hours maceration at a value of 15, 2 gVL, dropping further to a value of 13, 4 gVL in the case of a longer macerări, 36 hours. As a result of the process of maceration, and inoculation with selected yeasts and enzymes have been found that the optimal variant to reach a full bodied wine, rich in extract is the variant V4, with optimal macerating time of 12 hours. It is noted in figure 4 that the first three variants extract varies between 13.4g/L and 18.4g/L. The optimum reached 22.4g/L in the solution V4, the leaching time 12 hours. If we follow the values obtained in the other two variants of maceration of 4 hours and 36 hours shows that prolonged maceration does not lead to an accumulation of the extract, being very close to the values, around 21,8g/L.

Figure 4. dry extract resulted in wines from the varieties Muscat Ottonel and Tămâioasă Românească digested for 2h, 12h, 36h and fermented by the four variants.: V1-without the addition of maceration enzymes, spontaneous fermentation; -Maceration with spontaneous fermentation, pectolytic enzymes; V3-maceration with pectolytic enzymes, fermentation with selected yeasts; V4-maceration with pectolytic enzymes, fermentation with selected yeasts, potentiating flavors with glycosidic enzymes

For Tămâioasă Românească same increase is observed unreduced dry extract by maceration time and the addition of enzyme and yeast selected. Thus for a time of 2 hours maceration extract increased from 14.8g/l to 26.2g/L depending on the variant selected work. For a 12 hour soaking the indicator

is between 15.2g/L and 26.4g/L, and the maceration for 36 hours have values between 13.4g/L and 21.8g/L. There is a decrease in this parameter proportional to the time of leaching in the last two types of time. A decrease of about 4% of the indicator is relevant to enable selection of the optimal variant for it.

Glycerol expressing taste qualities (harmony, softness) of wine, contributing effectively to the setting is aromatic and sensual.. Glycerol is the second major product after alcoholic fermentation of ethanol in wine, so close monitoring of the process. This product is formed in the first part of this contibuind alcoholic fermentation to maintain redox balance wine and osmotic stress in the regulation of the musts for yeasts especially rich in sugars.

Figure 5 shows the influence of time of maceration and fermentation additions in the two species studied. For a 2-hour soaking time have a relatively low amount of glycerol from 3.8 to 4.8g/L.

Figure 5. The concentration of glycerol in wines from the varieties Muscat Ottonel and Tămăioasă Românească digested for 2h, 12h, 36h and fermented by the four variants: V1-without the addition of maceration enzymes, spontaneous fermentation; -Maceration with spontaneous fermentation, pectolytic enzymes; V3-maceration with pectolytic enzymes, fermentation with selected yeasts; V4-maceration with pectolytic enzymes, fermentation with selected yeasts, potentiating flavors with glycozidic enzymes.

The explanation could be involved in the fermentation of yeast yield for both spontaneous and muscadine varieties Muscat Ottonel Romanian. A maceration for 12 hours, and 36 hours the amount of glycerol increases only 10/12%. Variations in which both selected yeasts and enzymes have brought a significant intake were obtained amounts of glycerol with 200% higher than in the simple variants. So in the version V4, a maceration time 2 hours have accumulated 8,6 g/L, respectively, 3 g/L glycerol, to 12 hours maceration it grew to 9, 6g/L, and at a time of 36 hours of maceration glycerol presented values of 9,8 g/L, respectively, 1 g/L.

CONCLUSIONS

Maceration has a positive effect on the quality of white wines in Drăgășani winery. During maceration contact is made between the grape skins and selected the optimal time leads to wines with more pronounced floral character;

The physico-chemical extraction maceration leads to a more pronounced specific compounds, the time of maceration is very important in this case;

Maceration enzymes lead to increased fruity notes of aromatic wines thus increasing their potential.

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