

The influence of the maceration temperature on extraction process of terpens compounds in flavoured wines technology

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Abstract

The wines obtained by flavoured and part-flavoured kind of grapes are representative through their sensorial characteristics. At this point of view, the young wines are defined by some sensorial characteristics like freshness, fructuous, intense and persistence flavoured.

All this kind of grapes contain the same elements of flavour with localization in the grapes peel, the difference between the intensity and the quality of the flavour is explicative by the different proportion of the terpenic compounds.

The obtain of the high quality flavored wines, with typical attribute require the presence of an important technological desideratum in the process of wines elaboration and also, using of certain flavour conservation and stabilization methods.

The extraction of the compounds which characterized the varietals flavour (free terpens) and their release by glicozidic precursors can be realized by different prefermentative process like the maceration and specially the maceration temperature.

Keywords: maceration, extraction, free volatile terpens, bound terpens, flavoured wines

1. Introduction

The wines come from vinification of the flavoured grapes are very different towards other white wines through their sensorial characteristics. From this point of view, the young wines are defined by some sensorial quality like freshness, with fruit aroma which is intense and persistence, good acidity.

All varieties of grapes have same elements of flavour, specially localized in the peel. The different between the aroma intensity and quality is in the proportion oh these compounds.

The obtain of some type of wines, with certain attribute of tipicity, require the obligatory presence of some important technological desiderate in obtaining process. Also it is necessary to use particular techniques for preservation and stabilization of flavoured compounds.

On bases knowledge the volatile compounds we analyze the better technological operation which allow the rational exploitation of the flavour constituents.

The extraction of the compounds which characterize the varietal aroma (free terpens) and also their liberation from the glycoside precursors can be realize by pre-fermentation method. The most important is the maceration process and especially the temperature of maceration.

2. Materials and Method

For this study, we use the grapes from the Muscat Ottonel variety, cultivated in Dragasani vineyard.

The Muscat Ottonel grapes were harvest at the technological ripeness. The grapes processing was made under SO₂ protection (6 g/100 kg grapes) and the distribution of

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the must was made under homogenization in next variants:

- V₁ – white vinification
- V₂ – classic vinification for 36 hours
- V₃ – maceration in ROTO at 20⁰C, for 12 hours
- V₄ – thermal shock at 45⁰C, come back at 25⁰C and maceration in ROTO for 6 hours.

For analysis the influence of maceration temperature on the extraction process of the flavour compounds we conceive of next scheme:

- V₁ – white vinification
- V₂ – maceration at 25⁰C for 8 hours
- V₃ – maceration at 20⁰C, for 8 hours
- V₄ – maceration at 20⁰C, for 12 hours

With approve of the methodology certified by OIV and adopted by ICSVV at the technological maturity of the grapes it was determined the glucoses, acidity, TVL, TLP, linalool, α -terpineol and geraniol contents.

3. Results and Discussion

The influence of the maceration process on the terpens compounds content and other characteristics of the must are presented in table 1.

The dates from table 1 put in evidence that the maceration process determine enrichments of the must in terpens compounds in all categories. The maceration in rotary tank without alcoholic fermentation, assure the realization and conservation of the higher level contents in terpens compounds (linalool, α -terpineol and geraniol).

The application of the thermal shock before the maceration process (variant V₄), determined an increase of the bound terpens in precursors content, of linalool and α -terpineol, also. The extractions which realize during the maceration process or maceration – fermentation process until the phases separation, haven't same intensity for all terpens compounds. The geraniol content accrues the maxim rhythm of accumulation. Then, in decreasing way, follow the free volatile terpens, α -terpineol, linalool, and in last, the bound in precursors terpens..

Table 1. Influence of the maceration process on the terpens compounds content of the grapes must

No.	Characteristic	Variant			
		V ₁	V ₂	V ₃	V ₄
1.	Sugar g/l	210	160	210	210
2.	pH	3.21	3.26	3.25	3.31
3.	Hexanal μ g/l	1480	2200	2080	3260
4.	Hexanol μ g/l	203	336	707	664
5.	Hexen 2 – ol μ g/l	135	20	22	38
6.	TVL μ g/l	870	1900	2050	2150
7.	TLP μ g/l	2100	2900	3000	3050
8.	Linalol μ g/l	234	297	364	376
9.	α -terpineol μ g/l	148	288	248	311
10.	Geraniol μ g/l	62	240	206	181

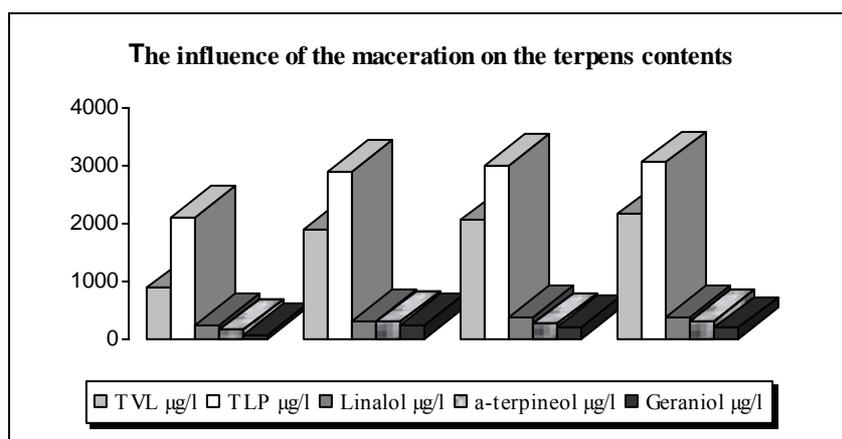


Figure 1

The combinative effect warming – maceration determine an important increases in the terpens concentration. That may be referable to additional enrichment of the bound forms during the maceration and liberation of the free forms during the warming process. The bigger quantity of terpens at the warming variant confirmed

the hypotheses that these compounds are produced by chemical synthesis in must + core or peel, or are produced by acids hydrolysis of the terpenil-glucosis.

So, the maceration temperature has an important influence on the extraction of the terpens compounds (table 2).

Table 2. The influence of the maceration temperature on the terpens compounds

Terpens compounds (µg/l)	Temperature and durate of the maceration		
	25 ⁰ C/8 hours	20 ⁰ C/8 hours	20 ⁰ C/12 hours
Free volatile terpens (TVL)	2160	1840	1930
Bound in precursors terpens	3890	3610	3680
Linalol	1660	913	1095
α-terpineol	320	270	290
Geraniol	410	320	380

The dates from table 2 put in evidence that in the lower temperature condition (20⁰C), the extraction process of the specific compounds of the solid phases is, evidently, tardigrade. The extension, in this case, of the maceration duration at 12 hours determine enrichment in the specifically aroma compounds. These values are situated under the values recorder by the variant V (maceration at 25⁰C for 8 hors).

At this experiment, we can say that the free volatile and also bound terpens (TVL and TLP) recording lower values at variant with small temperature and duration for maceration process (1930 µg/l for TVL and 3680 µg/l for TLP) comparative with values at the variant with bigger temperature and duration for maceration and extraction

process (2160 µg/l for TVL and 3890 µg/l for TLP).

Same evolution it is observe in evolution of the different free fraction of the terpens (linalool, α-terpineol and geraniol).

The free and bound terpens content is different in the sediment of the wine function by the temperature and duration of maceration and also, by the vinification mode (table 3).

The sediment on which wine stay a while after finishing alcoholic fermentation contain an important quantity of terpens compounds which was adsorption by the sediment cell or rest unextraction yet, in the core and peel residual.

Table 3. The content of the free and bound terpens of the different wine sample conditioning with and without sediment

Variant	Terpens content (µg/l)	
	Free volatile terpens (TVL)	Bound terpens (TLP)
V ₁ – Testifier	1030	1800
V ₁ – With sediment	1335	1600
V ₂ – Testifier	1850	2500
V ₂ – With sediment	2150	2000
V ₃ – Testifier	1820	2400
V ₃ – With sediment	2250	2000
V ₄ – Testifier	1870	2600
V ₄ – With sediment	2100	1900

The sediment content mostly free volatile terpens (table 3).

An considerable different present the wine from white vinification, follow by the wine elaborate by maceration in rotary tank.

The dates from figure 2 put in evidence higher contents of the free volatile terpens when the wine was distilled with sediment and lower content in bound in precursors terpens. So, confirmed the fact that one part was adsorptive during alcoholic fermentation on the yeasts wall.

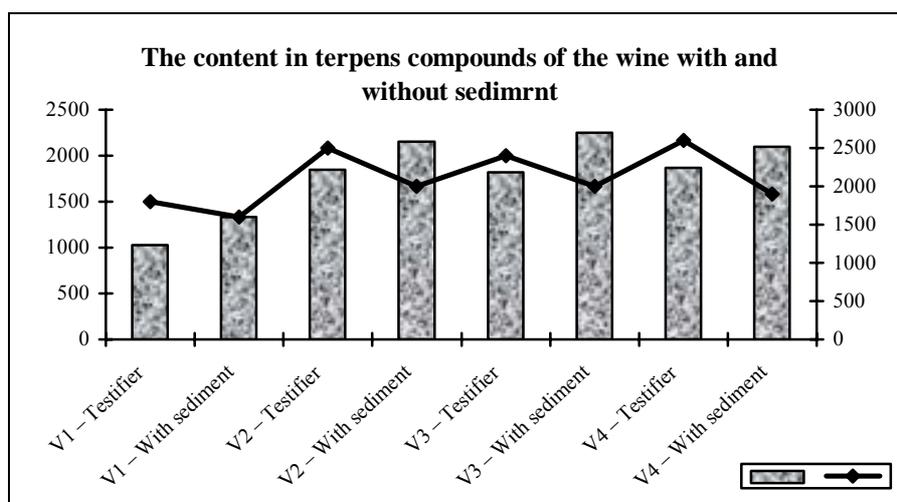


Figure 2

The quantitative lost, due to terpens compounds training by carbon dioxide result at the alcoholic fermentation, was put in evidence through the capitation of the training compounds at cooling at – 80°C. From analysis result that, in bigger proportion, the eliminated compound is ethanol, follow by izoamilic alcohol, izobutanol and linalool.

4. Conclusion

Maceration process bring important increase in flavour potential of the wine through increase of the free volatile and bound in precursors terpens increase.

Using the maceration at the lower temperature, the extraction process of the flavour compounds is more leisurely, needed the extension of the maceration duration.

In condition of maceration in rotary tank, the extraction phenomenon of the terpens compounds by solid fraction is more leisurely comparatively with classic maceration process.

The application of the thermic shock follow by maceration brings an increase in terpens compounds (TVL and TLP).

The alcoholic fermentation produces a decrease of the free and bound terpens contents by reason of the adsorption of yeasts cell or training with carbon dioxide result at fermentation.

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