

CONTRIBUTIONS TO THE DETERMINATION OF PYRAZINIC FLAVOURS IN SAUVIGNON BLANC WINE – BLAJ VITICULTURAL CENTRE, TARNAVE VINEYARD

CONTRIBUȚII LA DETERMINAREA AROMELOR PIRAZINICE DIN VINURILE DE SAUVIGNON BLANC - CENTRUL VITICOL BLAJ

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Abstract. *Sauvignon Blanc variety accumulates pyrazinic compounds in the grain husks and these give the wine vegetal flavors of pepper. The aromatic character of the pyrazines is a result of their low basicity and their resistance to oxidation. Methoxy-izobutilpirazina (IBMP) and methoxy-izopropilpirazina (IPMP) of Sauvignon blanc wine, the crop of 2008, have been determined. Depending on the duration of the maceration of the grape seeds with husks, the quantities are as follows: 20.978 to 35.848 5.096 to 15.254 ppm ppm IBMP and IPMP.*

Key words: pyrazines, metoxipirazine, pellicular maceration

Rezumat. *Soiul Sauvignon blanc, acumulează în pielețele boabelor compuși pirazinici, care imprimă vinului arome vegetale de ardei iute. Caracterul aromat al pirazinelor rezultă din bazicitatea lor redusă și rezistența la oxidare. Au fost determinate, metoxi-izobutilpirazina (IBMP) și metoxi-izopropilpirazina (IPMP) din vinurile de Sauvignon blanc, recolta anului 2008. În funcție de durata procesului de macerare a mustului cu pielețele boabelor, cantitățile sunt următoarele: 20,978-35,848 ppm IBMP și 5,096-15,254 ppm IPMP.*

Cuvinte cheie: pirazine, metoxipirazine, macerație peliculară

INTRODUCTION

The aromatic character specific to Sauvignon Blanc variety is due to the pyrazinic and thiolic compounds that are present in wine (Marais J. 1994, Tardea C, 2007). In cool climates, such as Tarnava vineyard, the pyrazinic flavors dominate to the detriment of the thiolic flavors. The former gives some typical characteristics to the wines produced in these areas. The high temperatures during the ripening period of the grapes determine a decrease in the pyrazinic content.

The main pyrazinic compounds in Sauvignon blanc wines are 3-isobutyl-metoxipirazine (IBMP) and 3-isopropyl-2-metoxipirazine (IPMP). These are to be found in grain husks and they give vegetal and green peeper flavors to the wine. Pre-fermentative pellicular maceration optimizes the pyrazinic aromatic character (Maggu M. et al. 2007).

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MATERIAL AND METHOD

The research was carried out in 2008. The grapes originated from a Sauvignon Blanc plantation from S.C.D.V.V. Blaj (Research and Development Station for Viticulture and Vinification Blaj). We devised 3 experimental variants in microvinification conditions.

V1 – grape crushing, grape debunching and must separation

V2 - grape crushing, grape debunching 16 hours pellicular maceration and must separation

V3 - grape crushing, grape debunching 24 hours pellicular maceration and must separation

The must has suffered a static clearing through decantation at a low temperature. This process has been carried out through administration of pectolytic enzyme preparations. Alcoholic fermentation has taken place through the action of yeasts from the spontaneous flora, under a controlled temperature (16-18°C). After 14 days from the onset of alcoholic fermentation we have carried out the first decantation and sulphitation at a level of 40 mg/L free SO₂.

The wines have also been administered sodium bentonite in a dose of 0.8 g / L. In 20 days after administration of bentonite, there was performed the filtering operation using sterile plates and this was followed by bottling.

The variants were analyzed through physico-chemical procedures, organoleptic procedures and through the approved official methods. Afterwards the IBMP and IPMP pyrazinic compounds were dosed using gas chromatography.

RESULTS AND DISCUSSIONS

The year 2008 may be characterized as a normal year for Research and Development Station for Viticulture and Vinification Blaj, with slightly higher temperatures in the summer months (+1.7 to +2.8) and a higher rainfall regime (table 1).

Table 1

Climatic data in RDSVV Blaj, 2008

Month	Monthly average temperature (°C)			Rainfall amount (mm)		
	recorded	normal	dif.+/-	recorded	normal	dif.+/-
January	-1,7	-2,7	+1,0	9,1	26,3	-17,2
February	2,3	-0,1	+2,4	10,5	21,2	-10,7
March	6,4	4,7	+1,7	31,5	23,9	+7,6
April	11,4	10,4	+1,0	69,0	68,3	+0,7
May	16,3	15,2	+1,1	78,3	80,2	-1,9
June	21,1	18,3	+2,8	100,8	93,6	+7,2
July	21,5	19,8	+1,7	105,5	99,0	+6,5
August	22,0	19,3	+2,7	22,7	64,0	-41,3
September	14,9	15,1	-0,2	62,1	56,7	+5,4
October	12,1	9,5	+2,6	90,7	36,6	+54,1
November	5,4	3,8	+1,6	40,7	36,5	+4,2
December	2,4	-1,1	+3,5	65,8	33,3	+32,5
Yearly values	11,1	9,4	—	686,7	639,6	—

The physico-chemical composition parameters that characterize the quality of Sauvignon blanc wines from the RDSVV Blaj are: alcohol - 11.35 to 11.70% vol, total acidity from 4.26 to 4.71 g/L sulphuric acid, volatile acidity 0.32-0.38 g/L acetic acid, dry non-reducing extract from 19.00 to 20.80 g/L, sugars.

Table 2

The physico-chemical parameters of the composition of Sauvignon blanc wines – RDSVV Blaj, 2008

The analyzed parameter	Alcohol c titre (%vol)	PH	Total acidity g/L H ₂ SO ₄	Volatile Acidity g/L CH ₃ COOH	Reducing Sugars g/L	Non-reducing dry extract g/L	S02 total mg/L	S02 Free mg/L
V1	11,35	3,12	4,71	0,32	9,90	19,00	94,0	25,4
V2	11,65	3,32	4,26	0,38	5,52	19,48	1.11,0	25,8
V3	11,70	3,33	4,50	0,36	5,50	20,80	108,0	26,4

From the analysis of IBMP and IPMP pyrazinic compounds, which determine the flavor of Sauvignon blanc wines, we found concentrations above the limit of sensory perception in all experimental variants (table 3). The lowest values of 20.97 ppm IBMP and 5.09 ppm IPMP were in variant V1, while the highest values were found in V3 - 33.44 ppm IBMP and 15.25 ppm IPMP, with a 16-24 hours pellicular maceration period.

The conclusion is that Sauvignon wines produced in RDSVV Blaj contain a high quantity of pyrazinic aromatic compounds, something that gives them their specific characteristics, typical to Sauvignon blanc. Pre-fermentative pellicular maceration facilitates the extraction of pyrazines from the husks of grains. This process is correlated with the duration of contact between the solid and liquid phase of the pulp (figure 1). As this time increases, the IBMP and IPMP levels in wines are higher.

Table 3

IBMP and IPMP concentration values in Sauvignon wines, RDSVV Blaj

Experimental values	IBMP		IPMP	
	Determined value ppm	Sensory perception threshold ppm	Determined value ppm	Sensory perception threshold ppm
V1	20,97	2	5,09	2
V2	27,17	2	6,83	2
V3	33,44	2	15,25	2

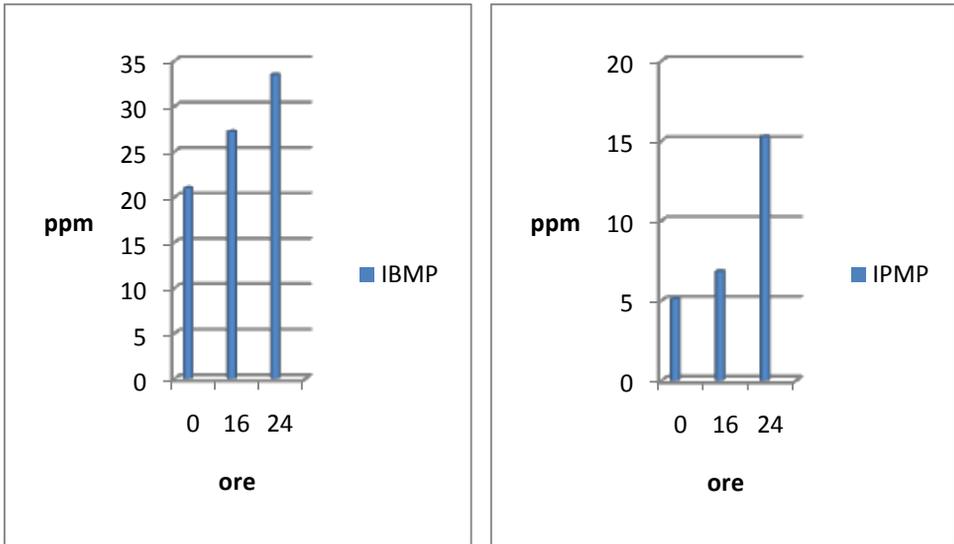


Fig. 1 - The evolution of IBMP and IPMP concentrations according to the duration of the pre-fermentative pellicular maceration period in the case of Sauvignon Blanc wines

CONCLUSIONS

1. The pre-fermentative pellicular maceration process technology used in the preparation of Târnave Sauvignon blanc wines is necessary to highlight the semi-flavored potential of this wine variety. The quantity of pyrazines in the wine varies depending on the duration of contact between the husks of grains and the must: IBMP concentrations between 20.97, and 33.44 ppm, and IPMP between 5.09, and 15.25 ppm.

2. We recommend a 16-24 hours pre-fermentative pellicular maceration in order to process the Sauvignon blanc variety. This should be carried out at temperatures of 16-18°C so that one might obtain wines with vegetal/pyrazine flavors characteristic to this variety.

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