UVALINO WINE: CHEMICAL AND SENSORY PROFILE•

Daniela BORSA, Federico PIANO, Federica BONELLO, Luca CHIUSANO, Maria Carla CRAVERO
CRA – Centro di Ricerca per l'Enologia – Via P. Micca, 35 – 14100 Asti, AT, I.
E-mail: daniela.borsa@entecra.it

Keywords: autochtonous vine, Uvalino, sensory profile

1. INTRODUCTION

'Uvalino' is a Piedmont native cultivar only recently admitted as licensed Italian grapevine. This cultivar is late ripening, vigorous, fertile and productive. Its grapes are characterized by a high content of tannins witch are responsible for bitterness and roughness of wines. The Uvalino wines need two years of ageing (Schneider, 2007). Previous works had shown that the polyphenolic profile is characterized by a high hydroxycinnamic tartaric acids and resveratrol content that make Uvalino quite different from other cultivars grown in Piedmont (Borsa *et al*., 2003). It's important to point up that resveratrol content in grapes reaches its maximum in the early growth stage and it decreases during ripening. On the contrary, resveratrol content rises up till the ripening stage in the case of the 'Uvalino' grapes. Furthermore, resveratrol passes from the grape into the wine, as is shown by the data recorded on single-variety wines during many years (Borsa *et al*., 2003).

The aim of this work was to assess Uvalino wines produced in different years. The chemical data were compared with the sensory profiles.

2. MATERIALS AND METHODS

Two experimental wines from different vintages (2004 and 2006) were evaluated in 2009. Standard analyses (alcohol, dry extract, total acidity, pH) were carried out according to the official methods (G.U. C.E. n. 272 3/10/1990). Polyphenol indexes (Di Stefano *et al.*, 1989), colour intensity and hue were measured too. Free and glycoside aroma compounds of wines were analysed by GC and GC-MS as described in Di Stefano (1991).
The wine sensory profiles were performed by the trained panel of the CRA-ENO (12 tasters) following a procedure (Cravero, Ubigli, 2002) derived from ISO norms (11035-1994). Tasting sessions were realized in duplicate with ISO (3591-1977) approved glasses in an ISO (8589-2007) tasting room. The reported results are the average of the two sessions.

3. RESULTS AND DISCUSSION

Uvalino wines showed a high alcohol content, a low acidity and a high pH (tab. 1). Moreover they had a high content of polyphenolic compounds. The concentration of

• QUAD. VITIC. ENOL. UNIV. TORINO, 31, 2009-2010

anthocyanins was particularly low, while the content of tannins was high. Flavan-3-ols content was consistent during wine aging. Despite the low concentration of anthocyanins, color intensity was high: this proves that the molecules that give color to the wines had reached a high degree of stability probably due to co-pigmentation reactions. The characterisation of varietal and fermentative aromatic compounds showed a high content of benzenoids, particularly 2-phenylethanol and benzyl alcohol. Their presence, together with acetate and ethyl esters, gave to the wines important sensory features correlated to the sensory analysis.

Tab. 1- Chemical-physical properties of Uvalino wines.

	Parameters	**2004**	**2006**
Current analyses	Alcohol (% vol.)	15,03	13,06
	Dry matter (g L^{-1})	32,05	32,55
	Total acidity (g L^{-1})	5,2	5,7
	pH	3,70	3,62
Poliphenolic components	Total anthocyanidins (mg L^{-1})	114	156
	Total flavonoids (mg L^{-1})	2161	2366
	Folin index (mg L^{-1})	2447	2508
	Total proanthocyanidins (mg L^{-1})	2722	2727
	E420+E 520	0,880	0,948
	E420/E520	0,970	0,863
	E 420+ E520 + E620	0,998	1,073

The evaluation of the wine sensory profile (fig. 1) showed that fermentative aromatic compounds play a key role in the aroma of wines.

Isoamyl acetate, 2-phenylethanol and 2-phenylethyl acetate (tab. 2), responsible for fruity and floral notes of wines, were the substances more correlated with the sensory descriptors identified. Some other compounds contributed to the olfactory features of the wines, despite their concentration was lower than their identification threshold. Thus probably synergy and masking phenomena took place and the taster could not distinguish the individual contribution of each compound to the wine odour. The sensory profile of the wines showed that the taste and the olfactory persistence were consistent over time.

The structure and the astringency were high even in the older wine. The visual description of the wines showed that orange hues increased as the wine aged: this observation highlighted the evolution of colour. Spicy and aromatic herb notes became more intense in the older wine.

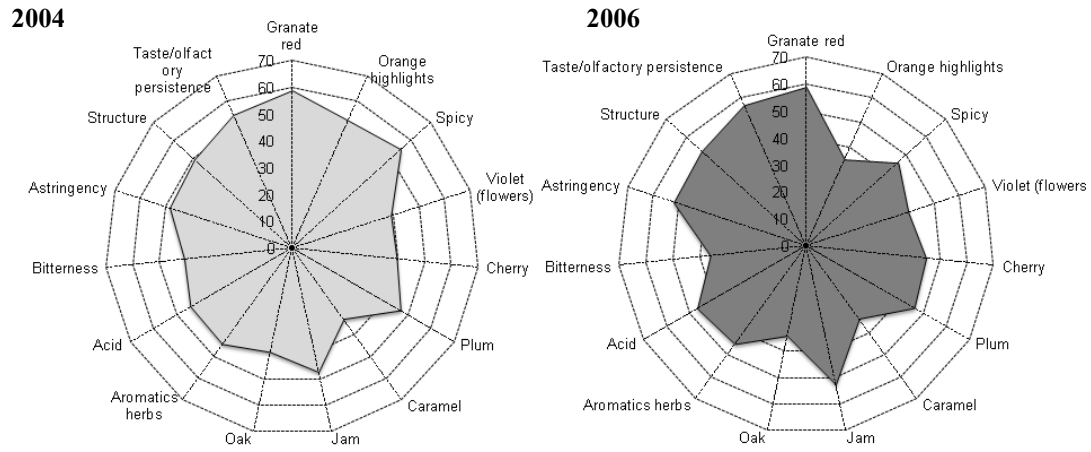

Fig. 1 - Sensory profile of 2004 and 2006 Uvalino wines.

Tab. 2 - Free aroma compound content of Uvalino wines (mg L^{-1}).

	2004	2006
Isoamyl acetate	0,27	0,25
2 Phenilethyl acetate	0,11	0,12
Ethyl hexanoate	0,13	0,12
Ethyl lactate	28,99	33,99
Ethyl octanoate	0,20	0,18
Ethyl decantate	0,07	0,09
1-Hexanol	0,47	0,54
γ- Butyrolactone	4,67	5,276
Diethyl succinate	23,40	20,70
3 methyl tio-propanol 1	1,32	1,03
Tyrosol	13,88	7,49
Sherry Lactone 1	1,44	1,58
Sherry Lactone 2	0,98	0,61
β CH3 γ octalactone	0,15	0,29
α – Terpineol	0,05	0,06
Benzaldehyde	0,05	0,07
4-Vinylphenol	0,96	0,63
Benzoic acid	0,51	1,21
Guaiacol	0,23	0,24
Methoxy Eugenol	0,12	0,13
Methyl Vanillate	0,16	0,19
Benzilic Alcol	3,47	2,05
2-Phenylethanol	77,85	76,63
4-Vinyl guaiacol	0,63	1,21
Vanillin	1,27	0,78
Syringic aldehyde	1,15	0,61

4. CONCLUSION

The results confirmed that Uvalino wines show a color stability during aging despite a low concentration in anthocyanins. Benzenoid, acetate and ethyl esters, together with other fermentative compounds, were the major responsible of the olfactory profile of wines. The chemical and the sensory analysis showed how different molecules present in wines can contribute in a complex way to the formation of their sensory profile.

Abstract

The evaluation of different chemical compounds present in Uvalino wines was correlated with sensory analysis. The analysis showed a high content of polyphenolic compounds responsible for the organoleptic properties of wine, including color, astringency and bitterness. Particularly low was the concentration of anthocyanins, while the high tannin content was responsible for the high intensity of the sensation of astringency. The color was perceived as more intense in the aged wine, despite the low concentration of anthocyanins. The characterization of varietal and fermentative aroma compounds showed a high content of benzenoids.

Literature cited

Borsa D., Corino L., Borio M., Monticelli L., Di Stefano R. – 2003 - *Acta VII International Symposium of Oenology*. Arcachon, F.

Cravero M.C., Tsolakis C., Bonello F., Pisano G., Borsa D. – 2008 - Caratterizzazione chimico-fisica e sensoriale di vini Malvasia a DOC del Piemonte. *Riv. Vitic. Enol.,* 2-3-4, 195-214.

Cravero M.C., Ubigli M. – 2002 - Metodi di valutazione sensoriale per la caratterizzazione varietale dei vini rossi. *Industria delle bevande*, 31, 342-349.

Di Stefano R., Cravero M.C., Gentilini N. – 1989 - Metodi per lo studio dei polifenoli dei vini. *L'Enotecnico*, 25, 83-89.

Di Stefano R. – 1991 - Proposition d'une méthode de préparation de l'échantillon pour la détermination des terpènes libres et glycosides des raisins et des vins. *Bull. OIV*, 64, 219-223

Schneider A. – 2004 -Vitigni autoctoni piemontesi da riscoprire-*www.viten.net/pdf/309.pdf*