

Zoning influence in chromatic parameters in Monastrell grape.

Influence du zonage dans des paramètres chromatique du raisin du cépage Monastrell

Rosario VILA LÓPEZ*, Pascual ROMERO AZORÍN, José Ignacio FERNÁNDEZ FERNÁNDEZ, Adrián MARTÍNEZ CUTILLAS, Rocío Gil MUÑOZ

Viticultura Department, Instituto Murciano de Investigación y Desarrollo Agrario y Alimentario (IMIDA), c/Mayor, s/n, 31050, La Alberca, Spain

*Corresponding author: mariar.vila2@carm.es

Summary

Zoning analysis determine homogeneous areas principally from the point of view of the medium, giving as a result a map which cartographic units synthesize the relations between the edaphic factors; morphological factors of the soil and climatic factors. The combination of these types of parameters allows to obtain maps of suitability of the optimum areas for the crop of the vineyard. At present it has been delimited and characterized eight grape areas belonging to the D.O. Jumilla. The chosen plots has been: Varahonda, Cañada del Judío, Cañada de Albatana, El Carche, Rubializas, Agüeros, Cortijo del Agrio and Casa Vistalegre.

The determined parameters are: Phenological parameters: Dates of sprouting, flowering, veraison, and harvest. Chemical parameters during maturation: total phenolic compounds, anthocyanins to pH 1 (extractable anthoc.) and anthocyanins to pH 3 (Total anthoc.), seed ripeness (MP) and index of cellular ripeness (IMC).

As for the determination of chromatic parameters and of extractability, in the plot of Cortijo del agrio the biggest quantity of anthocyanins has been obtained on having finished the period of ripening, on the other hand the plot of Cañada del Judío is the one that has obtained the highest values of extractable polyphenols. In our study, for the IMC lower value has been obtained for the plot located in Cañada del Judío and the highest value for the plot of Cortijo del agrio. As for seed ripeness Rubializas and Cortijo del agrio are the plots that obtained the lowest values.

Keywords: zoning, monastrell, chromatic parameters

Introduction

The wine sector is crossing a difficult conjuncture with elevated surplus and the UE pressing to pull up vineyards and to liberalize the wine market, this is why this one considers urgent the necessity of a firm bet by the quality and a better knowledge of its wine production zones, with the objective that if finally it is necessary to reconstruct the sector and to pull up part of the present vineyards, pull up those that are producing wines of worse quality and stay those that give balanced and good productions.

In Spain the quality wine production is centred fundamentally in a system of territorial distribution based on the Denominations of Origin and to this respect, Huglin considered already in 1978 that these boundaries would have to be related to the ecological zones more adapted for the vineyard, this is why the importance of the zoning, being understood by zoning the investigation of the territory with the aim to distribute it in relatively homogenous zones like result of the interaction between the vineyard and the environment (Morlat *et al.* 1992; Fregoni *et al.* 1998). This type of studies also is being developed in Spain from principles of the years 90 (Sotés *et al.* 1993) in Ribera del Duero.

In the grapevine, the zoning allows to affirm the vocation by certain productions, for example, wine or table grape, to indicate which varieties have more adaptation in each place, to know the environmental limitations for the crop and to lay the bases of studies on genuineness and originality of the production that allow to establish areas with geographic indication or denomination of origin and within them singular subsectors by its potentiality to give wines of differentiated quality.

Origin Denomination (D.O.) of Jumilla wines is located in the high levantin plateau, region of transition between the “Manchega” plain and the Mediterranean earths. Approximately the 42,000ha that constitute their vineyards, are extended by the municipality of Jumilla in Murcia and six municipalities of the S.E. of Albacete: Ontur, Tobarra, Albatana, Hellín, Montealegre and Fuente Alamo.

Elevated territory, of 400 to 900 m., climate hard, continental although influenced by the relatively next Mediterranean. Very dry, warm in summer and cold in the short winters.

Their grounds are brown and brown-reddish, limestone, loose, stony, that have been developed on stony limestone deposits coming from miocenic alluvia of the surrounding mountain.

The main variety of the zone is the red Monastrell that constitutes more of 80% of the vineyard. Is a noble variety, austere, resistant and with small clusters, with grapes also small, of dark coloration and great content of sugars and other noble components of the extract.

Also Garnacha, Cencibel, Cabernet Sauvignon, Syrah and Merlot are cultivated, between red varieties, and the much less extended are the white ones: Airen, Macabeo, Malvasía and Moscatel of slight grain.

With this work we tried to begin the study of deeper and developed project of zoning of the D.O. Jumilla, it has been begun valuing the results obtained for some chromatic parameters in the grapes of eight zones of this D.O.

Material and methods

The selected plots belongs to the D.O. Jumilla that were object of sampling are Varahonda, Cañada del Judío, Cañada de Albatana, El Carche, Rubializas, Agüeros, Cortijo del Agrio y Casa Vistalegre, their characteristics are described in Table 1 and appears indicated their situation in Figure 1.

Plot	Zone	Surface	Altitude	Slope
Varahonda	N	19,7206	875,86	0,818
Cañada Albatana	NW	9,8146	692,95	1,755
Cañada Judío	SW	5,5610	449,09	1,115
El Carche	E	10,3980	605,99	2,582
Rubializas	W	1,4160	715,59	1
Agüeros	NW	3,7475	820,05	2,152
Cortijo del agrio	N	6,5120	899,51	1,505
Casa Vistalegre	N	2,2525	836,4	0,838

Table 1 General characteristics of selected plots of the Jumilla D.O.

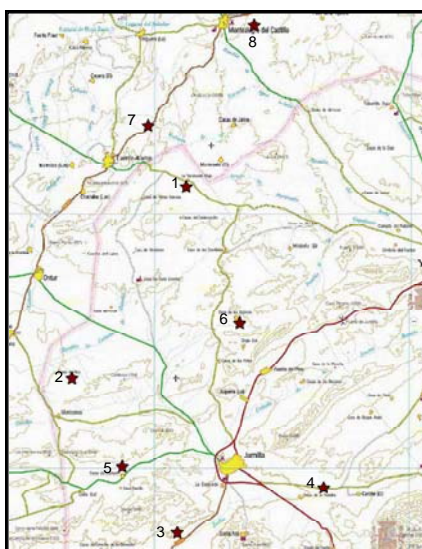


Figure 1 Situation map of the selected plots.

The sampling has been carried out by the Regulating Council of the Jumilla D.O. of representative and random form, approximately every 10 days. The samples have been picked up between 3 of August and 24 of September of 2007, taking several clusters from different stocks from each one from the assigned plots and from all parts of the cluster. Five samplings have been made in each zone.

The samples of 300g of grapes are crushed with a robot coupe GT 550 during 2 minutes. Part of that crushed is centrifuged during 15 minutes at a speed of 5000 rpm.

For phenolic compounds three methods different from extraction are made (Lamadon 1995, Saint-Cricq 1998 and Iñiguez 1998), since the information that they provide is different. With these analysis we obtain the results corresponding to the following parameters: total phenolic compounds, anthocyanins to pH 1 (removable anthocyanins), anthocyanins to pH 3,6 (total anthocyanins). The intensity of color is determined by measurement in espectrofotómetro UV/vis by means of usual method the CEE regulation 2676/90. From the removable Poliphenols and total and removable anthocyanins are determined by means of mathematical formulas IMC (cellular maturity index) and MP (seed maturity index) (Valdés *et al.*, 2005).

Results and discussion

The harvested grapes in the Cañada de judío and Cortijo del agrío plots are the ones that greater intensity colour shown values between 3,7 and 9,8 between the principle and end of ripeness, whereas the monastrell of Cañada de Albatana are the ones of smaller value in this parameter varying between 3,57 and 6.11.

If the Figure 2 is observed the evolution of the content in total anthocyanins during the maturation for each one of the studied plots, it is possible to be verified that the grapes of the Cañada de albatana are those of minor contained in these, showing the other quite similar contents. Unlike the study made for the Valdepeñas D.O (Hermosín I., *et al* 2007) does not happen in our case that to greater altitude of the vineyard greater amount of anthocyanins

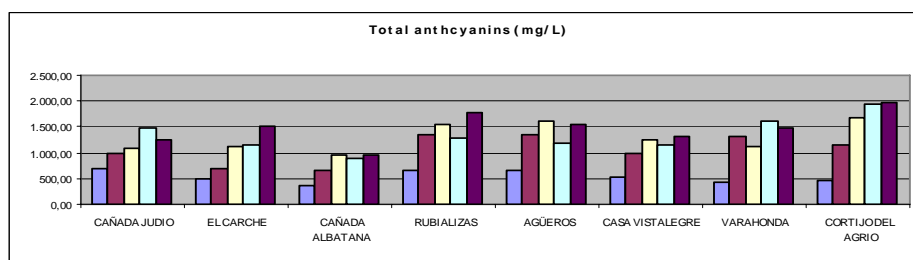


Figure 2 Total anthocyanins evolution during grape ripeness in the selected plots of de Jumilla D.O.

The study of removable poliphenols reveals that the grapes of the Cañada del judío plot are those that greater amount of this contains while those of Casa Vistalegre are the ones of less containing in the same ones.

Ripeness cellular index (IMC) or anthocyanic removability (%EA) provides information about the capacity of the anthocyanins of the grape to be extracted during the maceration stage, so that whichever greater it is his value greater will be the difficulty of extraction of the anthocyanins, reason why it is considered that so that the red grapes give quality wines they must have low values of %EA. And it is the grape of the Cañada del judío the one that presents a smaller value of the same one at the end of the ripeness, and the one of the Cañada del albatana is the one that presents shows minors average values during the evolution, being the one of Agüeros and Cortijo del agrío the ones that presents higher values of the index.

%MP parameter informs on the tannic contribution of the seeds to the wine, reason why high values indicates high content in aggressive tannins in wines. Therefore to obtain wines of quality from the red grapes they must have low values of %MP. In our case they are those of the parcels of Rubializas and Cortijo del agrío those that have shown the lowest values. In Figures 3 and 4 can be observed the evolution of IMC and MP parameters.

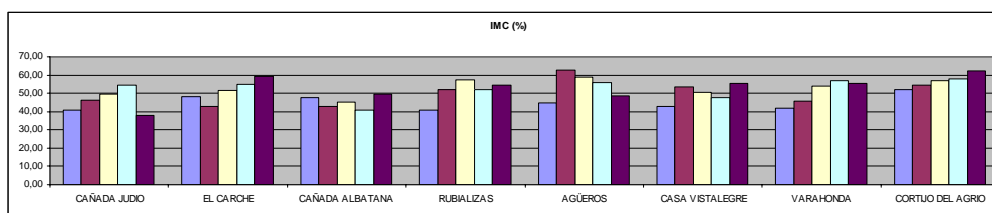


Figure 3 IMC evolution during grape ripeness in the selected plots of the Jumilla D.O.

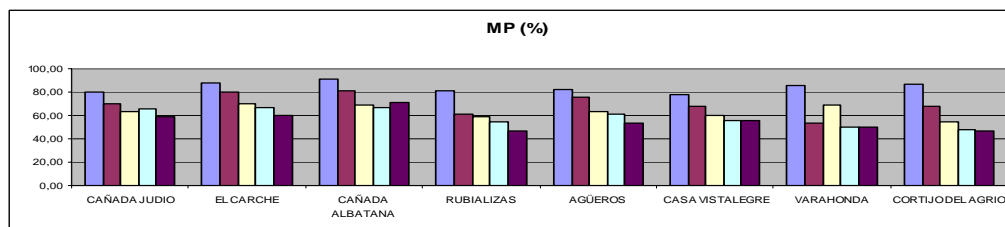


Figure 4 MP evolution during grape ripeness in the selected plots of the Jumilla D.O

Conclusion

With the work made until now it has been shown the chromatic characteristics of the grapes of each one of the parcels. It is observed that there are differences in the quality of the grape between the different plots and therefore will be necessary to have it in account at the time of managing the elaboration.

In this work the edaphic and climatic parameters with the quality parameters have not been correlated but it would be worth to apply efforts in this direction because it could be obtained conclusions about the correlation between the crop zone and the quality of the grapes.

Acknowledgements

This work has been supported by the Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria Subprograma Nacional de recursos y tecnologías Agrarias through the Project RTA2005-00103 and with the collaboration of The Fondo Social Europeo.

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