ADAPTATION OF ANCIENT WINEMAKING TECHNIQUES USING DRIED "*MUSCAT OF ALEXANDRIA*" GRAPES AND ACCELERATED AGING

M. Harutyunyan; R. Viana; J. Granja-Soares; M. Malfeito-Ferreira

Linking Landscape Environment Agriculture and Food (LEAF) Research Center; Enology Laboratory (DCEB), *Instituto Superior de Agronomia*, *Universidade de Lisboa*, Tapada da Ajuda, 1349-017 Lisboa, Portugal

INTRODUCTION

Sweet white wines were among the most appreciated in Ancient times. Classical Roman authors describe several techniques of vinifying dried grapes and storing wines on the roof of the cellars or under the sun. These wines may be regarded as the archetypes of present *Passito* wines and fortified *Madeira* wines.

The objective of the present work was to adapt the described techniques to present technological options, mainly concerning fermentation performance and wine evolution during accelerated aging.

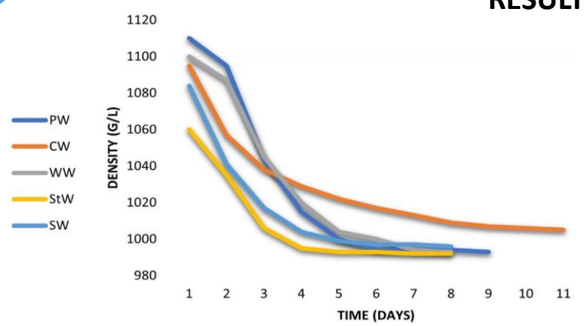
MATERIAL and METHODS

Muscat of Alexandria's grapes were grown in the experimental vineyard of Instituto Superior de Agronomia (Lisbon, Portugal). The grapes were harvested manually slightly over-ripe at 25 ºBrix and subjected to greenhouse drying under natural temperature. After 7-10 days, when grapes reached 30 ºBrix (30% weight loss), several processing protocols were used:

a) PW, juice obtained by foot treading.
b) CW, juice obtained by pressing grapes.
c) WW, rehydration of destemmed grapes with white wine.
d) StW, rehydration of grapes with stems with white wine.
e) SW, rehydration of grapes with salt water.
f) CWC, wine obtained from CW added of grape juice concentrated by boiling up to 1/3 initial volume.

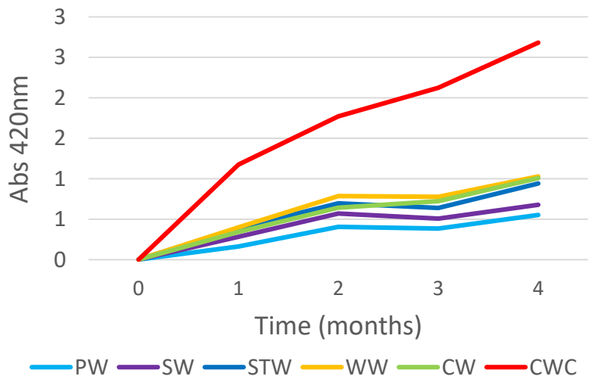
Juices, without berry skins, were inoculated with a commercial starter without sulphite addition. After fermentation, wines were sulphited, clarified by sedimentation and incubated at 4ºC and 45ºC for 4 months. A preliminary tasting was performed by 3 trained individuals.

RESULTS



Fermentation kinetics

- Density decreased below 1000 in PW, WW, StW and SW.
- Stuck fermentation occurred with juice obtained from dried grapes (CW)



Browning (Abs 420 nm) at 45ºC

- Intense browning was observed in wine added of concentrated grape juice (CWC)
- Browning increase was dependent on residual sugar

Table 1. Wine characterization by routine parameters.

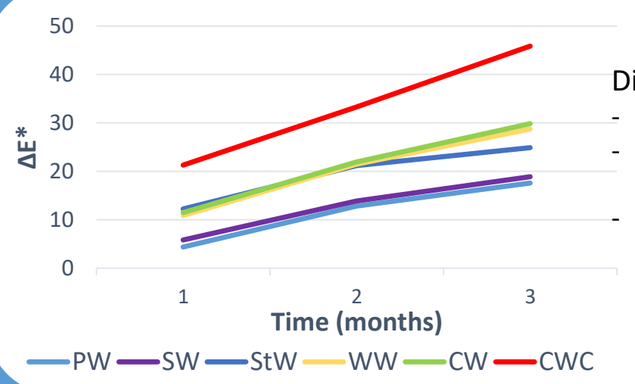
Sample	Ethanol (% *v/v*)	Sugars (g/L)	Volatile acidity (g/L acetic acid)	Total acidity (g/L tartaric acid)	pH
PW	15.0	0.8	0.21	5.10	3.90
CW	16.3	17.9	2.26	7.73	3.82
WW	17.0	6.1	0.39	4.73	3.95
StW	14.8	0.7	0.32	5.33	3.59
SW	14.8	2.6	0.50	4.65	3.85
CWC	12.6	125.8	2.15	8.03	3.94

The results showed ethanol levels according to initial sugar and dilution method.

The highest ethanol was obtained with fermentation of juices from destemmed grapes rehydrated with white wine.

Volatile acidity was less than 1 g/L in all wines, except in that obtained from concentrated grape juice alone, probably due to stuck fermentation.

In some of the wines, after fermentation, mousiness was clearly perceived but disappeared with further incubation at 45ºC



Difference in CieLab between 4ºC and 45ºC

- Sugar levels stimulated ΔE* increase
- Lower differences were observed in PW and SW
- Intermediate values for StW, with low sugar, might be explained by higher phenolic concentration due to fermentation with stems

CONCLUSIONS

The obtained wines showed that it was possible to obtain acceptable products closely following the protocols described in classical Roman manuals. The main problem was the detection of the mousy off-flavour that can be associated with the absence of sulphur dioxide addition to the musts before fermentation. High volatile acidity (more than 1 g/l) was not detrimental to wine sensory quality.

Incubation at 45ºC increased browning, clearly visible in the wine added of boiled juice. Mousiness was not perceived in wine incubated at this temperature

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