VINHOS DE TALHA: TO PITCH OR NOT TO PITCH

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In Alentejo, south of Portugal there is a traditional way of fermenting wines in clay vessels, known as "Vinhos de Talha". Clay vessels were traditionally impermeabilized using pine pitch, creating a barrier between the fermenting must and the clay. Due to this unusual production technology that uses of clay vessels, instead of inox or wood vessels, "Vinhos de Talha" present unique characteristics increasingly appreciated by national and international consumers when compared with wine obtained by the said traditional methods of winemaking. Although the positive consumers feedback, there is little literature about the physical-chemical characteristics of these wines (Martins et al, 2018; Cabrita et al, 2018).

This work aims to characterize the volatile composition of white wines produced in clay vessels with different coatings and to contribute to the knowledge and preservation of these wines that are a unique cultural heritage.

Wines

Wine samples were produced during 2019 vintage from white grapes, using the traditional technology associated to these wines. The clay vessels used have different coatings: new pitch (1), old pitch (2), no coating (3), epoxy resin (4) and bee wax (5). Wines were analyzed after the opening of the vessels in November.

Volatiles analysis by GC/MS

Analytical columns: ZB-WAX PLUS (30 m x 0.25 mm i.d., 0.25 µm df) connected with a ZB-5 MS (30 m x 0.25 mm i.d., 0.25 µm film df).

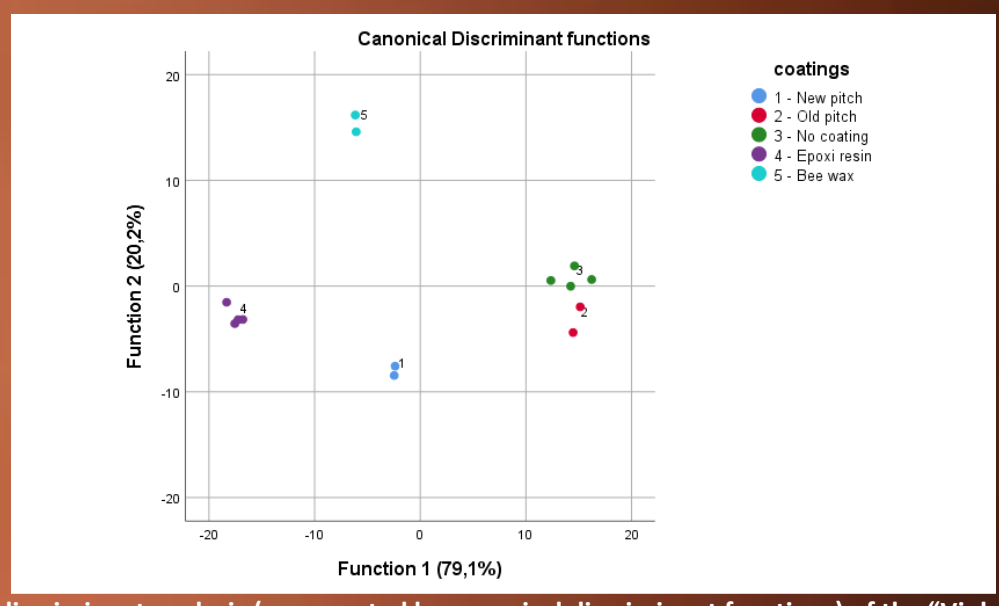
Oven temperature program began at 40 ºC hold for 1 min, raised at 7 ºC min^{-1}up to 210 ºC, then at 10 ºC min^{-1}up to 250 ºC and hold for 15.71 min.
Helium was used as carrier gas constant pressure of 35.0 Psi at the Electronic flow control (EFC 21) and 23.0 Psi at the EFC 24.
MS transfer line and source temperatures were set at, respectively, 240 ºC and 220 ºC.
Mass spectrometer was operated in the EI mode at 70 eV using a range of m/z 40-400 Da.

GC/MS: Bruker GC 456 - Bruker mass selective detector Scion TQ. CTC Analysis autosampler CombiPAL.

Results

In the volatile fraction of wines, a total of 58 compounds belonging to the chemical classes of the alcohols, esters, aldehydes, terpenoids, norisoprenoids, ketones, volatile phenols, sulphur compounds, lactones and carboxylic acids were identified and semi-quantified.

The results obtained with this canonical discriminant analysis, shows that a good discrimination was obtained for "Vinhos de Talha" produced in clay vessels with bee wax (5), new pitch (1) and epoxy resins (4). The wines produced in clay vessels with old pitch (2) and no coating (3) are similar, but well separated from the other wines.



Linear discriminant analysis (represented by canonical discriminant functions) of the "Vinhos de Talha" wines categorized into five groups according to the type of clay vessel coating.

Conclusions

The volatile profile of wines made in clay vessels is different depending on the characteristics of the coating used in clay vessels. The volatile fraction of wines from vessels with no coating and old pitch are the ones more similar.

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