

IMPACT OF THE APPLICATION OF VEGETABLE PROTEINS AND YEAST EXTRACT IN THE CHEMICAL AND AROMATIC PROFILE OF RED WINE

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Introduction

Fining wines are used to ensure the physicochemical stability and prevent the formation of hazes and deposits. Several fining agents (gelatin, isinglass, bentonite, etc.) are used by winemakers. These products are animal proteins or of mineral origin. However some strict vegetarians do not accept any beverage treated with products of animal origin. Consumers requirements have given origin to new alternatives to these products, such as proteins of plant origin and yeast extracts.



Material and Methods

Wine: The red wine 2015, was produced in the Escola Superior Agrária de Santarém winery, in Tejo region. The wine is a blend of Tinta Roriz, Syrah and Alicante Bouschet.

Fining agent: Pea protein (VP1), Patatin (patato protein) (VP2), Yeast extract (YE) and Gelatin (G). The fining agents were used at the minimum (D1) and maximum dosages (D2) suggested by the respective technical sheet. A wine containing no fining agent was used as a control (D0). All fining experiment were carried out in duplicate, extended for 7 days.

Chemical Analyses

Total phenolic Index (IPT), total anthocyanins (Ant), total tannins (Tan), colour intensity (CI) and hue were determined according the International Organization of Vine and Wine (OIV). The turbidity was also evaluated. The analysis of the volatile compounds was carried out by gas chromatography connected to mass spectrometry (GC-MS). It was employed an Agilent 7890A gas chromatograph equipped with a DB-WAX capillary column (30 m x 0.25 mm x 0.25 mm; J&W. Folsom. CA), connected to an Agilent 5973 mass selective detector (Agilent, CA, USA). The identification was done by comparing their mass with the NIST library and by analyzing the mass spectra of standards.

Sensory analysis

A panel of five trained judges, members of the 'Comissão Vitivinícola Regional of Tejo', evaluated the visual, aroma and taste properties. Ten attributes were selected: visual (limpidity and colour), arome (typicity, intensity and quality) and taste senses (typicity, intensity, persistence and quality), as well as the harmony (overall judgment).

Results

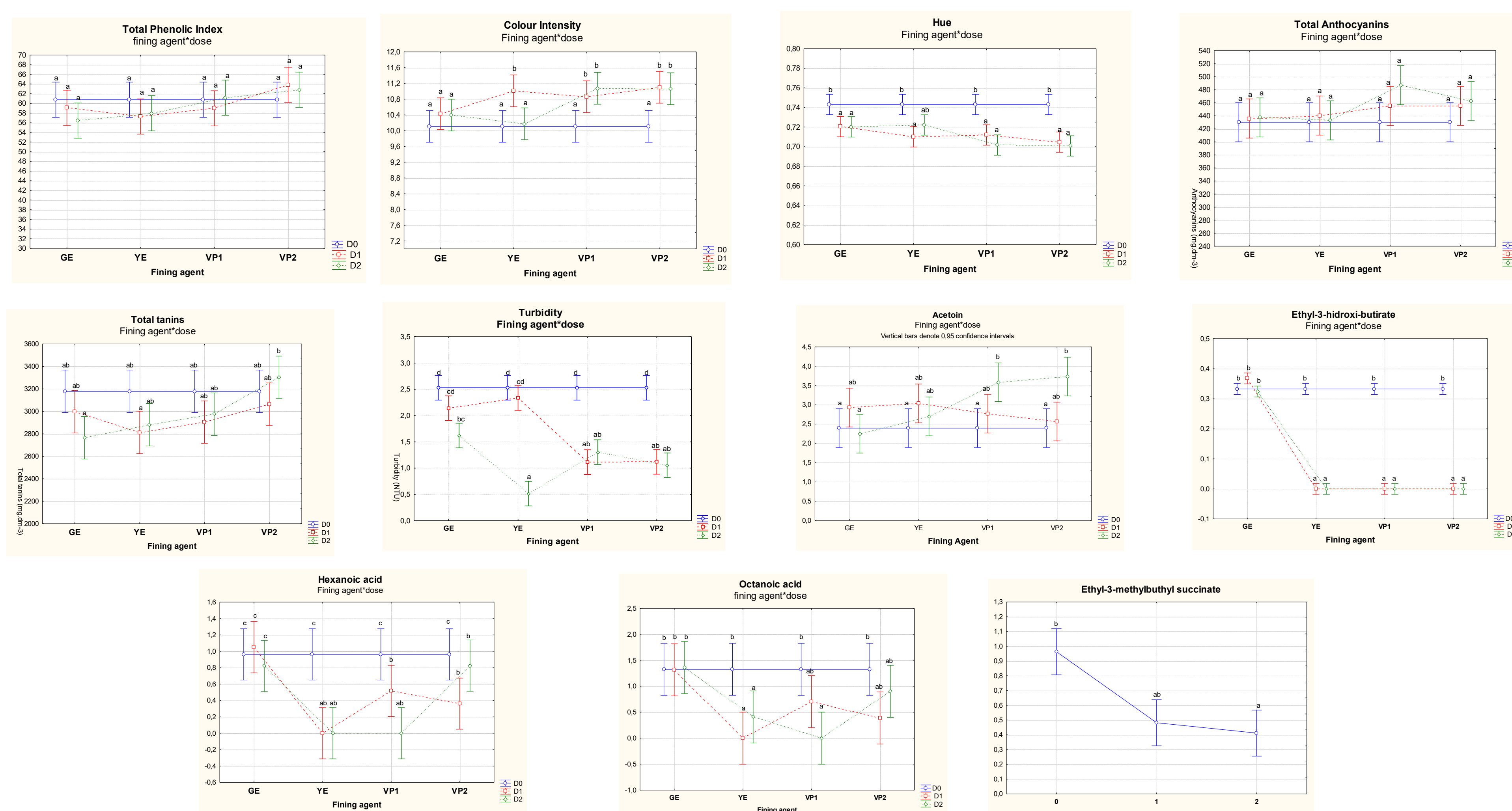


Table 1 – Analysis of variance considering the volatile compounds

Volatile Compounds	Fining Agent	Dose	Fining Agent * Dose
isobutyl alcohol	ns	ns	ns
Isoamyl acetate	ns	ns	ns
isoamyl alcohols	ns	ns	ns
acetoin	*	*	*
ethyl lactate	ns	ns	ns
1-hexanol	ns	ns	ns
ethyl-3-hidroxi-butirate	*	*	*
2,3-butanediol-meso	ns	ns	ns
2-metil-propanoic acid	ns	ns	ns
2,3-butanediol-levo	ns	ns	ns
γ-butyrolactone	ns	ns	ns
diethyl succinate	ns	ns	ns
hexanoic acid	*	*	*
ethyl 3-hidroxybutyrate	ns	ns	ns
2-phenylethanol	ns	ns	ns
octanoic acid	*	*	*
ethyl 3-methylbutyl succinate	ns	*	ns
ethyl vanilate	ns	ns	ns

Conclusions

- All fining agents improved the limpidity of the wines and progressive wine clarification.
- Vegetable proteins, yeast extract and gelatina revealed light impact on the wine phenolic composition.
- Only a few volatile compounds were removed by studied fining agentes.
- No significant differences in sensory analysis were observed.

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References

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