

## Comparison of ion exchange resins at industrial scale and oenological stabilizers treatments for tartaric stabilization of white Port wine: Impact on wine physicochemical and sensory profile

**Daniela Moreira<sup>1</sup>, Conceição Fernandes<sup>2</sup>, Rita Borges<sup>1,2</sup>, Celeste Marques<sup>3</sup>, Carlos Matos<sup>1</sup>, Alice Vilela<sup>1</sup>, Filipe-Ribeiro, L. <sup>1</sup>, Fernando M. Nunes<sup>1</sup>, Fernanda Cosme<sup>1</sup>**

<sup>1</sup>Chemical Research Centre (CQ-VR), Food and Wine Chemistry Lab, UTAD, Vila Real, Portugal.

<sup>2</sup>Mountain Research Centre (CIMO), ESA-Polytechnic Institute of Bragança, Portugal

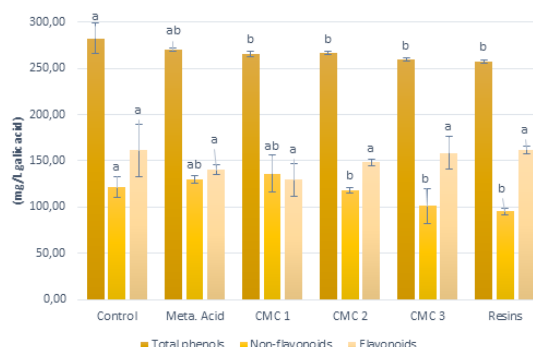
<sup>3</sup>AEB Bioquímica Portuguesa SA, Zona Industrial de Coimbrões, Viseu, Portugal

\* *danielamoreira-10@hotmail.com*

A frequent cause of stability loss in a wine is the formation of crystalline salts of potassium bitartrate (KHT) that appears mainly at low temperatures, as a consequence of a large decrease in its solubility [1, 2]. Although important for consumer's acceptance, there are only few studies regarding white Port wine tartaric stabilization. Therefore, tartaric stabilization has been carried out in a white Port wine by ion exchange resins, at an industrial scale, and by the addition of oenological stabilizers, with the main objective of comparing the impact of these treatments on wine physicochemical and sensory profile.

Port wine is a Portuguese fortified wine produced exclusively in the Douro Valley demarcated region. In this study, a white Port wine from the 2015 vintage from Gran Cruz winery, Portugal, was used and almost 20% from the total wine volume was treated by ion exchange resins (pH-Stab®). The stabilizers used were metatartaric acid and carboxymethylcellulose (CMC1 5%, CMC2 20%; CMC3 solid) with different structural characteristics. Wine tartaric stability was measured by the mini contact test. Wines phenolic composition - total phenols, flavonoid and non-flavonoid compounds, as well as the chromatic characteristics by the CIELab method, were also evaluated. Sensory analysis was performed by a panel of eight trained tasters. Twenty-one attributes were selected and were quantified using a five-point intensity scale.

As expected, all treatments assayed stabilized the white Port wine. All the samples presented a slight decrease in total phenolic compounds and non-flavonoid phenolic compounds. Concerning sensory analysis, wine treatment with ion exchange resins was more scored for the visual *limpidity* attribute and for the aroma attributes *citrus* and *tea*.



**Fig.1.** Total phenols, non-flavonoid and flavonoid phenolic compounds of treated and untreated wine.

### Acknowledgements:

This work was funded by the Chemical Research Centre (CQ-UTAD). Additional thanks to AEB Bioquímica Portuguesa.

[1] Berg, H. W., Keefer, R. *American Journal of Enology and Viticulture*, (1958), 9, 180–193.

[2] Ratsimba, B., Laguerie, C., Biscans, B., Gaillard, M. *Bulletin de la Societe Chimique de France*, (1989), 3, 325–330.