ELECTROCHEMICAL DIVERSITY OF ITALIAN WHITE WINES

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INTRODUCTION AND MATHODS

Oxidation of white wine phenolics occurs at different stages during winemaking and storage and can have important implications for wine sensory quality. **Phenolic compounds**, in particular those with a ortho-diphenol moiety, are main target of oxidation in wine. Voltametric methods are particularly suited for the analysis of oxidizable compounds such as phenolics. The redox-active species can be oxidized and reduced at the electrode, therefore, applications of electrochemistry have been developed both to quantify such species, and to probe wine maturation processes.[1] The electrochemical properties of wine phenolics have been examined using Cyclic Voltammetry (CV). Methods based upon disposable electrodes have been used, including carbon paste electrodes with undiluted wines.[2] The project aims at collecting and analysing large-scale **compositional dataset** related to Italian white wines.

RESULTS

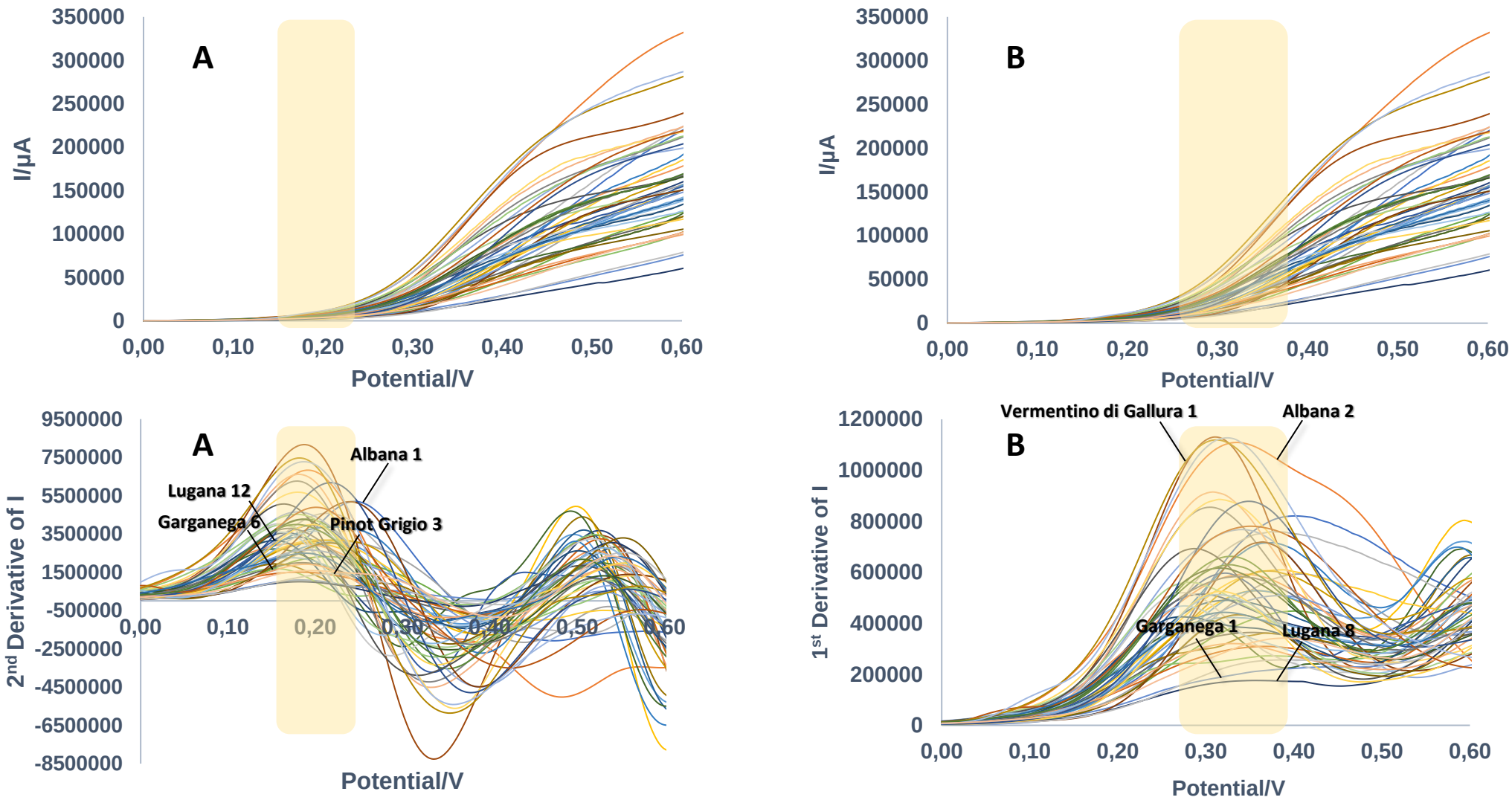

Fig. 1. Raw and derivative voltammograms (1st and 2nd derivative) of wines studied. Yellow areas highlight voltammograms regions of anodic oxidation onset (**A**) and readily oxidizable compounds such as caffeic acid, catechin, epicatechin, epigallocatechin gallate, epicatechin (**B**).

DISCUSSION AND CONCLUSION

The results obtained indicated a great diversity of voltametric responses, although the ability to identify electrochemical features that were typical of wine types was rather limited with raw data. To obtain a higher number of discriminant features, derivative voltammograms were built. In a 1st derivative, anodic current measured in the range of potential 0,30–0,50 V greatly varied across different wines, with samples Vermentino di Gallura 1 and Albana 2 exhibiting the highest signal, and samples Garganega 1 and Lugana 8 exhibiting the lowest anodic current. In a 2nd derivative, all wines with rapid oxidation onset showed peaks in the 0,15 – 0,18 V, like Lugana 12 and Garganega 6, while wines with slow oxidating onset showed peaks in the 0,20 – 0,25 V, like Albana 1 and Pinot Grigio 3.

REFERENCES

[1] P. A. Kilmartin, Electrochemistry applied to the analysis of wine: A mini-review, Electrochemistry Communications, 2016, 67, 39-42

[2] M. Ugliano, J. Wirth, S. Begrand, J. B. Dieval and S. Vidal, Oxidation Signature of Grape Must and Wine by Linear Sweep Voltammetry Using Disposable Carbon Electrodes, Advances in Wine Research, 2015, 1203, 325-334