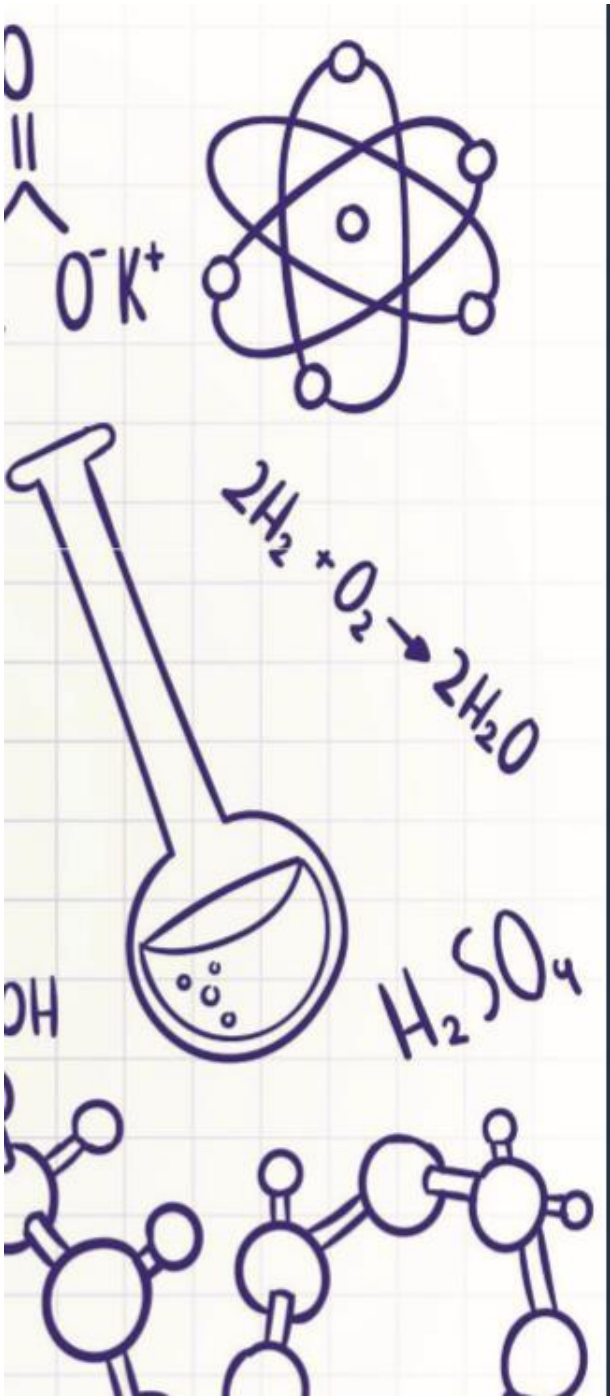

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Multi-elemental analysis in the differentiation of Portuguese wines according to their Protected Geographical Indication

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Portugal has the capacity of producing unique wines at special and demarcated regions, whose quality is increasingly recognized worldwide. The uniqueness of each demarcated region demands the development of methods that are able to ensure their authenticity and quality. The mineral composition of wines reflects the mineral composition of the "bedrock" and the multi-elemental analysis of wine has proven to be a valuable tool to ascertain its authenticity and geographic origin. The main goal of this work was to investigate whether the wines from different Portuguese Protected Geographical Indications (PGI) could be differentiated based on their multi-elemental analysis. For this purpose, 70 Portuguese wines, from 9 different regions, were analyzed for a wide panel of elements (53). Discriminant analysis was used to find the elements with greater discriminant power to distinguish among regions.

The analytical procedures used were those recommended by the Organisation of Vine and Wine (OIV), based on Flame Atomic Absorption Spectroscopy (FAAS) – for Na, K, Ca and Mg determination – and Inductively Couples Plasma Mass Spectrometry (ICP-MS) – for the trace element determination.

Since the OIV method for multi-elemental analysis of wine was only validated for 14 elements, a first step in this work was to validate it for a wider panel of elements, which was achieved for an additional set of 37 elements.

The multi-elemental analysis of the samples showed that the concentration of several elements was significantly different among regions. Discriminant analysis was used to analyze obtained data and showed that it was possible to differentiate the wines from the different PGI according to their elemental concentrations.

Despite being a preliminary work, performed on a limited set of samples, it was possible to verify that the concentration of certain elements is discriminant between PGI regions.

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