

Preliminary evaluation of trace elements content and sulfur speciation of wines produced in Greece

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The occurrence of trace elements and sulfur plays a significant role in the vinification process, may affect the organoleptic features of wines, can be related with the possibility of discrimination among different wine types and exerts a potential impact on human health [1,2]. Under this perspective and considering the currently increasing trend of wine consumption, the element profiles, together with copper and sulfur species were determined in 6 samples of white and 22 of red wines produced from Greek varieties. A total of twenty-three (23) macro constituents (Ca, K, Mg, Na) and trace elements (Ag, Al, As, Ba, Cd, Co, Cr, Cs, Cu, Fe, K, Li, Mn, Ni, Pb, Rb, Sr, V, Tl, Zn) were measured employing inductively coupled plasma mass spectrometry (ICP MS). The determination of sulfur speciation was performed electrochemically by linear sweep voltammetry (LSV), used for the first time worldwide in wine samples, while labile copper was determined by differential pulse anodic stripping voltammetry (DPASV). Despite the strong variation characterizing the trace element content of the Greek wine samples examined herewith, this was generally higher in red in comparison to white wines, with most of the values not exceeding the maximum acceptable limits imposed by legislation, being in accordance with values reported in literature. Further investigation is however required, in order to elucidate their potential connection with variety and geographical origin. Regarding sulfur, principally occurring in wines as SO₂, it was measured at higher levels in white wines in comparison to red ones, with its inert forms prevailing in white wine samples, whereas its labile forms in red ones. Respectively, copper levels detected in red wines significantly exceeded those measured in white ones. The lower percentages of labile copper in terms of total in wines indicate a significant copper complexation with SO₂ [3]. The results obtained were comparable to those reported in pertinent literature, albeit rather limited regarding copper and sulfur speciation in wines.

References:

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