

Selenium organic compounds and B-vitamins in red wine

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HPLC-ESI-MS/MS methods were developed for the determination of organic selenium compounds, specifically Se-methylselenocysteine (MeSeCys), selenomethionine (SeMet) and selenomethionine oxide (SeMetO), as well as B-vitamins specifically thiamine (B1), nicotinic acid (B3) and pantothenic acid (B5) in red wine. The chromatographic separation of organic selenium compounds was performed in isocratic mode by using a mobile phase of a methanol/water mixture (85/15, v/v). The separation of B-vitamins was performed by using a mobile phase of acetonitrile/formic acid (97/3, v/v) (HCOOH 8mM, pH 2.8) in gradient mode as follows: 0-3 min 80% B, 4-7 min 50% B, 9-13 min 70% B and 13-20 min 80% B.. The column for chromatographic separation in both methods was a ZIC-HILIC column (100 x 2.1 mm, 3.5 μ m) and the injection volume was 5 μ L. Both HPLC methods were optimized and validated through the determination of the slope, R^2 (correlation coefficient), LOD (limit of detection) and LOQ (limit of quantification). The results showed the presence of selenium compounds and B-vitamins in Kratošija wine and additionally, their changes were investigated in wines produced by two commercial yeasts used for alcoholic fermentation. The findings indicated that the content of selenium and B-vitamins compounds is related to the yeast, especially noted for SeMetO and nicotinic acid. These selenium species (Se-methylselenocysteine, selenomethionine and selenomethionine oxide) and B-vitamins (thiamine (B1), nicotinic acid (B3) and pantothenic acid (B5)) were determined for the first time in Macedonian red wine. This study provides a substantial basis for further research on the analysis of these antioxidant compounds in other red wine varieties and during winemaking.

Keywords: Organic selenium compounds, B-vitamins, HPLC-ESI-MS/MS, yeast, Kratošija wine

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