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Development, optimization and validation of a multimethod for the determination of 36 mycotoxins in wines by liquid chromatography-tandem mass spectrometry

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Abstract

A fast and efficient multimethod for the determination of 36 mycotoxins in wine, using ultra-performance liquid chromatography-tandem mass spectrometry (UPLC-MS/MS), was developed, optimized, validated and implemented in routine analysis. A simplified, quick extraction was performed with acetonitrile, derived from the QuEChERS (quick, easy, cheap, effective, rugged and safe) approach, which was traditionally developed for pesticides analysis. This study aimed at a single extraction and chromatographic separation for 36 mycotoxins.

Optimization tests were performed to find the proper ratio of wine: water and extraction solvent and the need for an additional buffering step with ammonium formate/ formic acid and a dispersive SPE cleanup with various sorbents. The dSPE steps did not show significant improvement in analysis results, therefore, it was not applied in the final method to be validated. The mycotoxins were separated and detected on a UPLC-MS/MS system, used in the ESI positive ionization mode. The various mycotoxins were divided in three different concentration level groups, according to their sensitivity in UPLC-MS/MS. The validation was performed by analyzing recovery samples at three

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