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Determination of carbamates in edible vegetable oils by ultra-high performance liquid chromatography-tandem mass spectrometry using a new clean-up based on zirconia for QuEChERS methodology

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Abstract

In this study a fast, selective and sensitive multiresidue method based on QuEChERS methodology has been evaluated and validated for the determination of carbamate pesticides, in edible vegetable oils by UHPLC-MS/MS. A new clean-up sorbent, SupelTM QuE Z-Sep+, has been successfully applied in vegetable oil extracts. Z-Sep+ was compared with other sorbents (i.e. mixture of C18 and PSA) previously used for dispersive solid phase extraction of these matrices, reducing more effectively matrix effects without a significant decrease of analyte recoveries. Matrix effect was studied in different matrices (extra-virgin olive, sunflower, maize, linseed and sesame oil) being ≤ 30 % for most of the studied pesticides. Under optimum conditions, recoveries ranged from 74 to 101%, with relative standard deviations lower than 10%. Limits of quantification ranged from 0.09 to 2.0 μg kg^{-1}; allowing their determination at the low concentration levels demanding by current legislation.

Keywords

Carbamates; UHPLC–MS/MS; Z-Sep^{+}; edible vegetable oils

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