Multiresidue Analysis of Multiclass Pesticides in Lavandin Essential Oil by LC/MS/MS Using the Scheduled Selected Reaction Monitoring Mode

In this paper we describe the development of the first multiclass pesticide residue method applied to essential oils. A total of 70 pesticides covering a wide range of polarity and currently used on essential oil crops have been included in the method. The procedure consists of a 10-fold dilution of lavandin essential oil followed by a direct injection analysis by liquid chromatography/tandem mass spectrometry. The system used is an API 4000 QTrap equipped with an electrospray ionization interface and operating in scheduled selected reaction monitoring acquisition mode. Matrix effects were evaluated by comparing the slopes of matrix-matched and solvent-based calibration curves. Weak signal suppression or enhancement (<20%) was observed for most of the compounds. Method sensitivity was determined statistically by the injection of five matrix-matched calibration curves with the distribution’s normality and the variance’s homogeneity checked before establishment of a suitable regression model. Limits of detection (LODs) and quantification (LOQs) were then determined using the blank standard’s deviation and the slope of the mean curve. The analytical method has been validated for 67 of the 70 pesticides and meets the following LOQs: ≤1 μg/L for 9 pesticides, ≤5 μg/L for 44, ≤10 μg/L for 9, and ≤20 μg/L for 5.
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