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CORRESPONDING AUTHOR

Giuseppe Federico Labella

giuseppe.labella@unimi.it

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Comparison between Accelerated Solvent Extraction (ASE) with clean up in-line and Quick, Easy, Cheap, Effective, Rugged, and Safe (QuEChERS) extraction in honey.

G.F. Labella ^{a*}, K. Bousova ^b, L. Hollosi^b, F. Arioli^a

^a Department of Health, Animal Science and Food Safety, University of Milan, Via Celoria 10, 20133 Milan, Italy

^b Special Solution Center Europe, Thermo Fisher Scientific, Im Steingrund 4, 63303, Dreieich, Germany

Abstract

Honey is a popular bee product widely consumed and therefore it has to be assured that it is free of contaminants and safe for the consumers. Many pollutants, including pesticides (Chauzat et al, 2011) and heavy metals (Tuzen et al., 2007) coming from the environment, could be the source of contamination for bee matrices. In this study the method performances of two solid- liquid extraction techniques, Accelerated Solvent Extraction (ASE) with clean up in-line and Quick, Easy, Cheap, Effective, Rugged, and Safe (QuEChERS) extraction, were evaluated and compared for the analysis of pesticide residues in honey. Fiftythree pesticides, belonging to different chemical classes, were investigated in orange blossom honey from German local market using method based on Gas Chromatography coupled with Tandem Mass Spectrometry (GC-MS/MS). The linearity ($R_2 > 0.985$) in solvent and in matrix was achieved for most of the compounds with both extraction techniques, however showing a strong matrix effect. The criteria for a good repeatability ($CV < 20\%$) were satisfied for the 92 % of the compounds with QuEChERS extraction and for the 74% of the compounds with ASE extraction. The recovery (evaluated at three different concentration levels) was the same for the two techniques at the lowest concentration level, while was better for QuEChERS than ASE at the highest level. Furthermore, QuEChERS method allowed a significant reduction of the time needed for sample preparation than ASE extraction.

References

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