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# EVALUATION OF SUPERCRITICAL FLUID CHROMATOGRAPHY COUPLED TO TANDEM MASS SPECTROMETRY FOR PESTICIDE RESIDUES IN FOOD

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## Highlights

- Analysis of pesticide residues in fruits and vegetables with Supercritical fluid chromatography.
- Reduction of matrix effects in complex matrices.
- Improvement of sensitivity of polar/acidic pesticides.
- Short run times.

## Abstract

Supercritical fluid chromatography coupled to triple quadrupole mass spectrometry has been evaluated for pesticide residues in food. In order to check its advantages and limitations it was developed a method to identify and quantify 164 pesticides in three different matrices (tomato, orange and leek). A carbon dioxide gradient with methanol (containing 1mM ammonium formate) was used allowing a flow rate of 1.5 mL/min that made the total run time of 12 min without any problem of overpressure. Addition of a post column flow 150µL/min of Methanol with ammonium formate/ formic acid was necessary to improve the ionization.

The matrix effect study revealed that the percentages of pesticides with irrelevant matrix effect (suppression lower than 20%) was 99% in tomato, 87% in orange and 62% in leek, whereas significant suppression (higher than 50%) was not found in tomato and only 1% of the compounds in orange and 3% in leek. These results compare favorably with that typically obtained in LC-MS/MS. The absence of water in the mobile phase, also provided some important advantages regarding LC-MS/MS as (i) higher retention of polar compounds in the column, which elute with high sensitivity and good peak shape and (ii) a general increase of the sensitivity of the analysis, consequence of the high ionization and ion extraction efficiency.

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