

1st International CIGR Workshop on Food Safety: Advances and Trends



Dijon, France, 14th and 15th April, 2011

Book of Abstracts



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Development of an LC-MS-MS ESI-qTOF Method for the Determination of Chloramphenicol

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Abstract. Chloramphenicol is an antibiotic from the class of amphenicols with broad-spectrum and highly effective. In humans, chloramphenicol can cause aplastic anemia and there are some concerns related to potential carcinogenicity and genotoxicity of this drug. In the apiculture, chloramphenicol is used to treat bees infected by bacterial diseases as in the case of foul brood disease, which infects the larvae and promotes the destruction of the hive in few days. Chloramphenicol also has been used in the honey to increase the bees' productivity, mainly in the summer when, due to high temperatures, bees become diseased and lethargic. To avoid risks of contamination, the European Union established that there is no tolerance for the residue of this drug on food. In 2006, Brazilian honey had a Rapid Alert in the EU due to contamination with chloramphenicol. The aim of this study was to develop a rapid method for chloramphenicol detection in commercially available honeys by ESI-qTOF mass detector. This system was chosen because it's high selectivity, sensibility and the capability to establish exact mass due to the orthogonal design of TOF. The LC separation was performed in an ultra performance chromatographic system Waters Acquity® and C18 (50x2.1mm, 1.7µm) analytical column. The mobile phase was aqueous formic acid 0.1% (A) and methanol (B), flow rate of 0.2mL/min. The detection was done by a high resolution mass spectrometer Waters Synapt® with electrospray ionization source (ESI) operating on positive mode (capillary=3.0kV). The compound presented four precursor ions with mass/charge (m/z) 323, 325, 327 and 329. The higher intense ions were acquired with m/z 305, 307 and 309 correspond to a loss of water molecule and this difference of two mass units observed for those ions is a characteristic for chlorinated compounds which can present different chlorine isotopes (³⁵Cl and ³⁷Cl) in its constitution.