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Multiresidue analysis of selected pharmaceutical compounds in poultry manure by gas chromatography–mass spectrometry

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Spreading poultry manure as fertilizer on agricultural fields has been promoted by national authorities as an economic way of recycling. However, poultry manure may contain contaminants, which could be incorporated into crops and be distributed in the environment. Among the different types of contaminants, emerging contaminants and particularly pharmaceutical compounds are rising concern due to their presence in different environmental matrices. In this work, an analytical method was developed for the simultaneous determination in poultry manure of 12 pharmaceutical compounds (acid, neutral or basic) belonging to different families (nonsteroidal anti-inflammatory drugs and analgesics among others). These compounds were extracted with acetonitrile by ultrasound assisted matrix solid phase dispersion in three steps at different pHs and then purified with C18. The compounds were determined by gas chromatography with electron impact mass spectrometric detection in the selected ion monitoring mode (GC-MS-SIM), using matrix matched standards to counteract the matrix effect. Recoveries from spiked samples at three levels (150, 75 and 25 ng g⁻¹) were ≥ 70 % for most of the compounds with relative standard deviations ≤ 12 %. The limits of detection and quantification ranged from 0.8 to 2.8 ng g⁻¹ and 3.0 to 9.3 ng g⁻¹, respectively. The response obtained with this method was linear over the range assayed (0 to 500 ng g⁻¹), with correlation coefficients ≥ 0.997. The validated method was applied to samples collected from different farms in Spain where salicylic acid was commonly found.

Biography

Ramón Aznar is a professional Agronomist Engineer with two MSc and more than 5 years of experience working in laboratories in Ireland, Italy and Spain, developing a good knowledge in environmental chemistry. Currently, he is at the edge of his PhD at INIA (fellowship grant, RTA2014-00012-C03-01). He has published more than 6 papers in international journals and is looking forward to have new challenges after finishing his PhD.

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