

Display Settings: AbstractSend to: 

Anal Bioanal Chem. 2011 Nov 20. [Epub ahead of print]

Determination of glyphosate in groundwater samples using an ultrasensitive immunoassay and confirmation by on-line solid-phase extraction followed by liquid chromatography coupled to tandem mass spectrometry.

Sanchís J, Kantiani L, Llorca M, Rubio F, Ginebreda A, Fraile J, Garrido T, Farré M.

Institute of Environmental Assessment and Water Research (IDAEA-CSIC), C/Jordi Girona, 18-26, 08034, Barcelona, Spain.

Abstract

Despite having been the focus of much attention from the scientific community during recent years, glyphosate is still a challenging compound from an analytical point of view because of its physicochemical properties: relatively low molecular weight, high polarity, high water solubility, low organic solvent solubility, amphoteric behaviour and ease to form metal complexes. Large efforts have been directed towards developing suitable, sensitive and robust methods for the routine analysis of this widely used herbicide. In the present work, a magnetic particle immunoassay (IA) has been evaluated for fast, reliable and accurate part-per-trillion monitoring of glyphosate in water matrixes, in combination with a new analytical method based on solid-phase extraction (SPE), followed by liquid chromatography (LC) coupled to tandem mass spectrometry (MS/MS), for the confirmatory analysis of positive samples. The magnetic particle IA has been applied to the analysis of about 140 samples of groundwater from Catalonia (NE Spain) collected during four sampling campaigns. Glyphosate was present above limit of quantification levels in 41% of the samples with concentrations as high as 2.5 µg/L and a mean concentration of 200 ng/L. Good agreement was obtained when comparing the results from IA and on-line SPE-LC-MS/MS analyses. In addition, no false negatives were obtained by the use of the rapid IA. This is one of the few works related to the analysis of glyphosate in real groundwater samples and the presented data confirm that, although it has low mobility in soils, glyphosate is capable of reaching groundwater.

PMID: 22101424 [PubMed - as supplied by publisher]

[+ LinkOut - more resources](#)

Related citations

[Efficient approach for the reliable c](#) [J Chromatogr A. 2006][Re-evaluation of glyphosate determin](#) [J Chromatogr A. 2006][Ultratrace-level determination of glyph](#) [Anal Bioanal Chem. 2008][Residue determination of glyphosae](#) [J Chromatogr A. 2005][Review Advantages and limitation](#) [J Chromatogr A. 2007][See reviews...](#)[See all...](#)

Recent activity

[Turn Off](#) [Clear](#)[Determination of glyphosate in groundwater samp](#) PubMed[See more...](#)You are here: [NCBI](#) > [Literature](#) > [PubMed](#)[Write to the Help Desk](#)

GETTING STARTED

[NCBI Education](#)
[NCBI Help Manual](#)
[NCBI Handbook](#)
[Training & Tutorials](#)

RESOURCES

[Chemicals & Bioassays](#)
[Data & Software](#)
[DNA & RNA](#)
[Domains & Structures](#)
[Genes & Expression](#)
[Genetics & Medicine](#)
[Genomes & Maps](#)
[Homology](#)
[Literature](#)
[Proteins](#)
[Sequence Analysis](#)
[Taxonomy](#)

POPULAR

[PubMed](#)
[Nucleotide](#)
[BLAST](#)
[PubMed Central](#)
[Gene](#)
[Bookshelf](#)
[Protein](#)
[OMIM](#)
[Genome](#)
[SNP](#)
[Structure](#)

FEATURED

[GenBank](#)
[Reference Sequences](#)
[Map Viewer](#)
[Genome Projects](#)
[Human Genome](#)
[Mouse Genome](#)
[Influenza Virus](#)
[Primer-BLAST](#)
[Sequence Read Archive](#)

NCBI INFORMATION

[About NCBI](#)
[Research at NCBI](#)
[NCBI Newsletter](#)
[NCBI FTP Site](#)
[NCBI on Facebook](#)
[NCBI on Twitter](#)
[NCBI on YouTube](#)

[Training & Tutorials](#)

[Variation](#)

[Copyright](#) | [Disclaimer](#) | [Privacy](#) | [Accessibility](#) | [Contact](#)

National Center for Biotechnology Information, U.S. National Library of Medicine

8600 Rockville Pike, Bethesda MD, 20894 USA

