



Pesticides identification in western Mediterranean rivers

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Identification and determination of pesticides together with their spatial distribution and potential source areas location is of major concern to understand the environmental path and behaviour of such pollutants in rivers. Their characterisation may depend on the type of farming activities and the location of anthropogenic pressures within the limits of drainage basins where types of agricultural practices and type of pollutants may also be correlated.

In this work, a combination of techniques, following environmental forensic criteria, is applied to analyse the presence and spatial distribution of pesticides. 53 pesticides were identified and quantified by liquid chromatography coupled to tandem mass spectrometry (LC–MS/MS) in 111 points of 5 major Western Mediterranean River basins in Spain: Llobregat (14), Ebro (24), Turia (33), Júcar (15) and Guadalquivir (24). Spatial analysis was established using Geographical Information Systems procedures after geolocation of the sampling points including their respective analytical results.

The results show a spatial pattern in both the presence and amount of contaminants found. The Llobregat river basin has a high presence of pesticides with an average of 80.5% of the total contaminants (53) analysed and an even distribution between the sampling point with less contaminants detected (41) and the sampling point with more pesticides (4%). In other river basins, contaminants have been also detected, although not to the same extent as in the Llobregat River: Turia River -21.4%, 5, 25-, Júcar River -14.5%, 2, 16-, Ebro River -13.3%, 1, 20- and Guadalquivir River -12.1%, 1, 16.

Detection of pesticides varies between basins although some pesticides may be seen as river basin specific. Nine contaminants have been only found in waters of the Llobregat River (Acethochlor, Alachlor, Azinphos ethyl, Diclofenthion, Fenoxon, Fenoxon sulfoxide, Parathion-ethyl, Propanil and Propazine) and two in the Ebro River (Atrazine-deethyl and Atrazine-deisopropyl).

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