



Occurrence of acidic PPCPs in surface and drinking waters by UHPLC-MS/MS

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The term “emerging pollutants” stands for the substances that are released in the environment for which currently no regulations are established for their environmental monitoring. Their occurrence is reported worldwide in a range of aquatic environments, such as lakes, rivers, freshwater catchments, estuaries, reservoirs and marine waters. However, there are still few studies on their occurrence, levels and distribution in River Basins from Spain.

This study is aimed at contributing information on the occurrence of three groups of emerging contaminants [U+2500] licit and illicit drugs and personal care products [U+2500] in the Turia River Basin. This River is a 280-km Mediterranean River with a flow rate 10.43 m³/s (Carmona et al., 2011), which is born in the province of Teruel and flows near the Valencia city. It has been selected because it is a typical Mediterranean River heavily affected by drought. The most 14 drank waters in Spain were analyzed to determinate the occurrence of some emerging pollutants. Selected contaminants include more than 40 pharmaceuticals, 5 personal care products and two illicit drugs. These substances were determined with an Agilent Technologies HPLC linked with a Triple Quad LC/MS in positive and negative ion mode using for compound separation a Waters C18 analytical column of 2.1x50mm and 3.5 μm particle diameter from Sunfire. The optimal mobile phase was a gradient of 5mM Ammonium fluoride in water (mobile phase A) and 5mM Ammonium fluoride in methanol (mobile phase B), at a flow rate of 0.2mL/min with a gradient that starts with 30% of mobile phase B and increase until 95% at minute 12 and remains 13 minutes more. The analytes were extracted from 250 mL of water by solid-phase extraction using Strata-X cartridges, eluted with methanol, evaporated and dissolved in 250 μL of methanol (Carmona et al. 2014). This procedure provides acceptable recoveries (>70%) and relative standard deviation (RSDs < 20%) at the limits of quantification, which are in the low ppb range ensuring sensitivity enough. Some of the studied compounds were detect at low amounts in the analysed water, which establish the real environmental occurrence of these potential contaminants. Further research will be devoted to characterize their sources and source pathways as well as to define and quantify processes that determine their transport and fate through the Turia River and to identify potential ecologic effects.

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References

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