THE ALBUFERA NATURAL PARK (Valencia, Spain): THE IMPACT OF PHARMACEUTICAL AND PERSONAL CARE COMPOUNDS

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INTRODUCTION

In the last years, the interest in detecting environmental contaminants in different matrices (mostly sediment, soil and water) is increasing because their more relevant impact on the global ecosystem. In this study, we focused on determination of Pharmaceutical Compounds and Personal Care Products. This field work is intended to propose an analytical methodology to assess and monitor the occurrence of emerging contaminants (EC) of the Albufera Natural Park. An area of 21120 hectares located 10 km to the South of Valencia City (Spain). The analysis were conducted on about 30 compounds, including acid, basic and neutral.

MATERIAL AND METHODS

Different steps of the extraction procedure were considered to optimize the recovery of the compounds. Regarding the solid-phase extraction (SPE), 2 cartridges with different stationary phases were tested: Phenomenex Strata-X 33 μm and Phenomenex Strata-X-CW 33 μm. Moreover the activation of cartridges with or without the use of a 2mM Sodium Dodecyl Sulfate (SDS) solution before the passage of sample was considered.

RESULTS AND DISCUSSION

It was compared the concentrations in different water samples: Waste Water Treatment WWTPs), irrigation channel and lake (Albufera) (Fig. 1).

Twenty-three pharmaceuticals were found in sediment samples. The most frequently detected (1-half of the samples) were salicylic acid, butylparaben, caffeine, clofibric acid, diclofenac, flufenamic acid, furosemide, thiampenicol, trimadol, triclosan and warfarine (Fig. 2).

CONCLUSIONS

This work shows the different conditions to extract (in SPE) many Pharmaceutical Compounds and Personal Care Products, successively, determined by HPLC/MS-MS.

The results of the 20 sediment and 35 water samples evidenced the presence of many of the selected EC in many environmental compartments of THE ALBUFERA NATURAL PARK.

This methodology produced an accurate outlook of a basal state for the Albufera Natural Park and could be developed in the context of a chronic monitoring of this site.

The results pinpointed the need of further studies on the short and long term ecotoxicological impact in animal and vegetal species.