



Pollution of wetlands with emerging contaminants due to the anthropic activity: The case of Valencia's Albufera Natural Park (Spain)

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Abstract

Currently, several scientist defend the starting of a new geological era, the “Anthropocene” where elements of earth are subjected to constant change, principally caused by anthropogenic forces (human-related) [1]. An important anthropogenic hazard is the environmental contamination that affects ecosystems [2]. Production, consumption and elimination of chemical compounds, such as pharmaceuticals and personal care products, are constantly growing and consequently also their presence in the environment. For this reason is very important to determine these compounds and to develop new analytical method. This study focused on determination of 30 Pharmaceuticals and Personal Care Products, including acid, basic and neutral [3].

Different analytical methods were developed and optimized to obtain the best efficiency and sensitivity. Samples analysed included water and sediment samples for L'Albufera Lake (Valencia, Spain) and its surrounding area. The extraction is based on solid-phase extraction (SPE) using a Reversed Phase and mixed mode with a Polymeric Weak Cation Phase. The determination was carried out by liquid chromatography-tandem mass spectrometry (LC-MS/MS) with a triple-quad using two precursor → product ion transitions for each compound in the multiple selected reaction monitoring mode (MRM).

The results evidenced the presence of many of the selected EC both in water and sediment. The most abundant ones are analgesic and anti-inflammatory drugs (salicylic acid, diclofenac), antihypertensive (furosemide), anticoagulant (warfarin), stimulants (caffeine) and preservatives (parabens).

These data pointed out that is important to optimize removal treatments and to create new barriers to avoid the discharges of EC to these sensitive environments. Overall, 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. Furthermore, the results pinpointed the need of further studies on the short and long term ecotoxicological impact in animal and vegetal species.

References

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