



Monitoring of perfluoroalkyl substances in the Ebro and Guadalquivir River basins (Spain)

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Relevant concentrations of a broad range of pollutants have been found in Spanish Mediterranean River basins, as consequence of anthropogenic pressures and overexploitation (Campo et al., 2014). In this study, the occurrence and sources of 21 perfluoroalkyl substances (PFASs) were determined in water and sediment of the Ebro and Guadalquivir River basins (Spain). PFASs are persistent, bio-accumulative and toxic, which make them a hazard to human health and wildlife. The Ebro and Guadalquivir Rivers are the two most important rivers of Spain. They are representative examples of Mediterranean rivers heavily managed, and previous researches have reported their high pesticide contamination (Masiá et al., 2013). Analytes were extracted by solid phase extraction (SPE) and determined by liquid chromatography coupled to tandem mass spectrometry (LC/MS-MS). In water samples, from 21 analytes screened, 11 were found in Ebro samples and 9 in Guadalquivir ones. In both basins, the most frequent were PFBA, PFPeA, PFHxS and PFOS. Maximum concentration was detected for PFBA, with 251.3 ng L⁻¹ in Ebro and 742.9 ng L⁻¹ in Guadalquivir. Regarding the sediment samples, 8 PFASs were detected in those coming from Ebro basin and 9 in those from Guadalquivir. The PFASs most frequently detected were PFBA, PFPeA, PFOS and PFBS. Maximum concentration in Ebro samples was detected for PFOA, with 32.4 ng g⁻¹ dw, and in Guadalquivir samples for PFBA with 63.8 ng g⁻¹ dw. Ubiquity of these compounds in the environment was proved with high PFAS concentration values detected in upper parts of the rivers. Results confirm that most of the PFASs are only partially eliminated during the secondary treatment suggesting that they can be a focal point of contamination to the rivers where they can bio-accumulate and produce adverse effects on wildlife and humans.

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References

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