

Title: Occurrence of emerging contaminants in Ebro Delta natural parc

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Perfluoroalkyl substances (PFASs) have been widely used since the 1950s and they have a high number of applications in the industry and commerce as a result of their outstanding chemical properties. However, over the last years they have drawn scientific attention due to their occurrence and persistence in the environment as well as their negative effects in the ecosystem and in human health. For example, perfluorooctane sulfonate (PFOS) which is one of the most used in the past, was included in the Stockholm Convention of persistent organic pollutants in 2009 and banned in most of the industrial and commercial applications but is still present in the environment. Because of this, it is important to monitor the occurrence of PFASs in the environment.

This work was executed in the frame of the PLAS-MED project in which the occurrence of 18 PFASs in environmental samples from Ebro Delta, corresponding to two different seasonal campaigns carried out in July 2018 and in February 2019, was evaluated. Previous optimized and validated methods were applied to their determination in seawater, river water and sediments samples by means of Solid Phase Extraction (SPE, waters) or Solid-Liquid Extraction (SLE, sediments) followed by Liquid Chromatography coupled to Mass Spectrometry in tandem (LC-MS/MS). The occurrence of these substances in Ebro Delta was compared with the ones from Mar Menor.

Perfluorocarboxylic acids were the most detected PFASs in all the studied samples. Four PFASs were detected in waters from Ebro Delta area and in samples corresponding to summer season indicating seasonal variation. Comparing these results with the ones from Mar Menor, these last ones showed lower concentrations of PFASs. Regarding sediment samples, these showed similar tendency and only five analytes were detected at quantifiable concentrations.

This seasonal variation observed in waters and sediments is an indicative of the influence of the environment (i.e. weather effects) to the presence of PFASs.

Keywords: PFASs, solid phase extraction, LC-MS/MS, Ebro Delta, water, sediments.