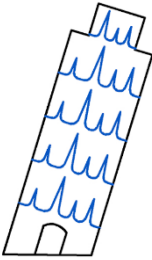

 Società
Chimica
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XXXI CONGRESSO NAZIONALE
della Divisione di Chimica Analitica
7-11 Settembre 2025, Pisa



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O-CHEMO-3

Mapping Emerging Organic Contaminants in wastewater, superficial and sub-superficial water by untargeted LC-HRMS

Caterina Durante¹, Lorenzo Strani¹, Mattia Pietropaolo¹, Daniele Tanzilli¹, Marina Cocchi¹, Barbara Benedetti², Guido Perra¹, Francesco Ronchetti¹, Samuele Pellacani¹

- 1) Department of Chemical and Geological Sciences, University of Modena and Reggio Emilia, Via Campi 103 41125 Modena (Italy)
- 2) Department of Chemistry and Industrial Chemistry, University of Genoa, via Dodecaneso 31, Genoa 16146, Italy

caterina.durante@unimore.it

Emerging organic contaminants (EOCs) can be of both natural and synthetic origin, and include a wide range of industrial, agricultural, pharmaceutical and consumer products, such as plasticisers, pesticides, fertilisers, antibiotics, hormones, parabens and PFAS (perfluoroalkyl substances) and their metabolites [1]. The main characteristic that makes them potentially hazardous is their poor biodegradability and their tendency to bioaccumulate in environmental matrices, potentially causing health damage in the long term, a first list of concern can be found in. This study aims at obtaining a first mapping of EOCs in different kind of water samples, such as surface water and groundwater, since these are vital resources for water supply for drinking, agricultural and industrial purposes, as well as wastewater (six sites sampled at entrance and exit of a wastewater treatment plants, WWTP). In fact, numerous studies have shown a correlation between the presence of these contaminants and treated water from conventional municipal, WWTPs [2], considering that WWTPs were not originally designed to remove these types of pollutants.

An untargeted approach based on uHPLC (using a ZIC-cHILIC stationary phase) coupled to high resolution mass spectrometry (by using Orbitrap Q-Exactive) was carried out to explore the presence of EOCs and for some of them estimate the content by using reference standards. EOCs were sampled and preconcentrated by solid phase extraction (by testing different SPE cartridges). The data arising from uHPLC-HRMS are very complex and we resort to Multivariate Curve Resolution – Region of Interest (ROI-MCR) method [3], taking care of properly optimizing the hyperparameters, followed by further multivariate data analysis to compare the different samples sites.

The present study is funded from the Ministry of University and Research under the Call for Proposals related to the scrolling of the final rankings of the PRIN 2022 call for proposals. Project Title: EXploitation of targeted and untargeted analytical strategies for WASTewaterR monitoring: toward a sustainable water management according to

the principles of circular economy- EXWASTER. Prot. n° 2022L3AH34. Principal Investigator: C. Durante.

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P-ABC-19

Perfluoroalkyl acids (PFAAs) occurrence in allochthonous catfishes from the lower stretch of the Po River (Northern Italy)

G. Perra (1), A. Spinardi (1), F. Ferrari (1), G. Castaldelli (2), L. Giari (2)

(1) Department of Chemical and Geological Sciences, University of Modena and Reggio Emilia, Modena, Italy; Department of Environmental and Prevention Sciences, University of Ferrara, Ferrara, Italy

guido.perra@unimore.it

Wild-caught freshwater fish have been identified as a source of human exposure to perfluoroalkyl acids (PFAAs), with Mediterranean river basins being less studied compared to other aquatic systems [1]. This study investigated the levels of four PFAAs contaminants in muscle and liver tissues of two non-native catfish species (*Silurus glanis*, the European catfish and *Ictalurus punctatus*, the North American channel catfish) from the lower stretch of the Po River (Northern Italy), a system crucial for the importance and history of PFAS pollution. To our knowledge, this is the first report of PFAAs detection in European catfish in Italy. The target PFAAs (PFOS, PFOA, PFNA and PFHxS) were analysed using an alkaline digestion method to release the compounds from the sample matrix, followed by weak anion exchange (WAX) solid phase extraction (SPE) and liquid chromatography-triple-quadrupole mass spectrometry (LC-MS/MS). The previously optimized method [2] was validated to EU Commission criteria, focusing on linearity, recovery, matrix effects, precision and limits of detection (LOD) and quantification (LOQ) [3]. Perfluorooctanesulfonate (PFOS) was the predominant PFAAs detected in all samples at the highest concentrations, confirming its high stability and bioaccumulation potential. The other PFAAs studied were present at lower levels, with potassium perfluorohexane sulphonate (PFHxS) below the LOQ in all fish samples, and perfluorooctanoic acid (PFOA) and perfluorononanoic acid (PFNA) detected at lower concentrations only in liver samples, contrasting with their ubiquitous presence in environmental matrices. No correlation was found between level of PFAAs and fish size as evidenced by other studies [2]. The analytical method's performance evaluation yielded reliable and accurate data, consistent with literature values for PFAAs analysis in biotic matrices and within the ranges specified in European directives for quantitative methods.

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