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Preliminary study about the detection of perfluoroalkyl substances in eel samples of Lake Garda by liquid chromatography tandem mass high resolution mass spectrometry (LC-HRMS).

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Abstract

Perfluoroalkyl substances (PFASs) are a large class of fluorinated aliphatic chemical of anthropogenic origin with high chemical stability even at high temperatures and in presence of alkalis, strong acids or oxidizing agents (Lau *et al.* 2004). All these characteristics make them non biodegradable and very persistent in the environment, associated with adverse health risks (Eriksen *et al.* 2010). Food, especially fish and other seafood, is considered the main source of exposure to PFASs (EFSA, 2012). In this preliminary study we developed and validated a sensitive, selective and specific method by LC-HRMS Orbitrap to monitor the presence of 16 PFASs in eel (*Anguilla Anguilla*) samples. The clean-up of the lyophilized samples consisted of a previous extraction step with acetonitrile to precipitate also proteins, followed by a purification step through Oasis® WAX SPE (Weak Anionic Exchange Solid Phase Extraction) cartridges. The method applied to 45 farmed eel samples from Lake Garda showed the presence of several PFASs, up to 10 in the same eel, in the order of ng/g (Fig.1). The results provided a representative situation of the PFASs contamination level of the lake, lower than those of others European countries (Hoff *et al.* 2005, Kwadijk *et al.* 2010).

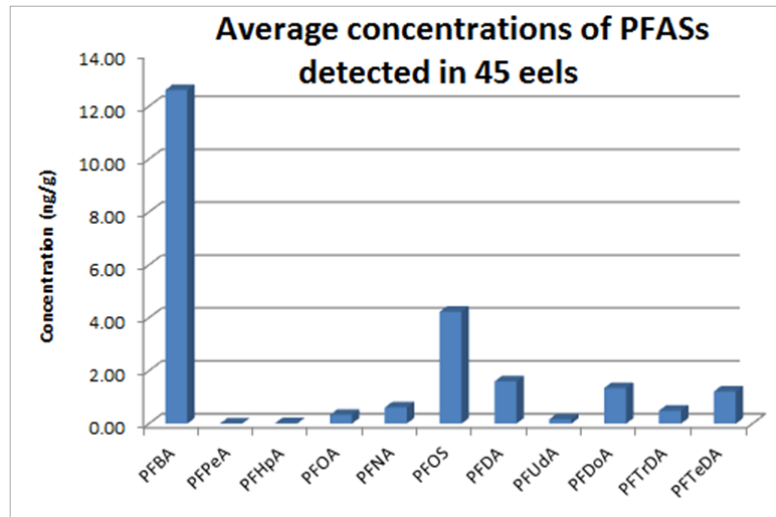


Fig.1: Average concentrations (ng/g) of the PFASs detected in the 45 eel samples of Lake Garda. PFBA: perfluoro-n-butanoic acid; PFPeA: perfluoro-n-pentanoic acid; PFHpA: perfluoro-n-heptanoic acid; PFOA: perfluoro-n-octanoic acid; PFNA: perfluoro-n-nonanoic acid; PFOS: sodium perfluoro-1-octanesulfonate; PFDA: perfluoro-n-decanoic acid; PFUdA: perfluoro-n-undecanoic acid; PFDoA: perfluoro-n-dodecanoic acid; PFTrDA: perfluoro-n-tridecanoic acid; PFTeDA: perfluoro-n-tetradecanoic acid.

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