Human impacts on the Northern Iberian Coast: Brominated pollutants

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01 INTRODUCTION

Plastic and textile products as well as electronical devices are easily flammable products and to reduce fire-related injury and property damage, such materials are commonly covered by the so-called flame retardants (FR).

The brominated flame retardants (BFRs) are the largest market group because of their low cost and high-performance efficiency. Nevertheless, as these compounds are additive rather than chemically bound to the products, they can be released into the environment and because they are toxic and persistent organic chemicals and can bioaccumulate, they have become contaminants of concern detectable in the environment, in animals, and in humans.

PBDEs (Polybrominated Diphenyl Ethers) are a group of 209 different congeners used as FR and, since 2004, banned in the EU. In spite of banned and restriction such chemicals are still detected in the environment and their monitoring necessary.

02 MATERIAL AND METHODS

SAMPLING

In 2016 a sampling campaign was carried out covering the North Spanish Atlantic coast from the border with Portugal to the limit with France on board the R/V Ramon Margalef.

For the collection of samples, a box-core was used.

METHOD

Sedimentological characteristics including grain size distribution and total organic content were measured.

Gas chromatography coupled to MS detector was used to perform the analytical analysis of BDE28, BDE47, BDE66, BDE85, BDE99, BD100, BD153, BDE154 and BD183 (Viñas *et al*, 2018).

All the procedure is under a strict QA/QC scheme that includes the use of blanks, duplicates, and the participation in intercalibration exercises.

Extraction
Extraction by PLE (pressurized liquid extraction) using hexane:acetone

Clean-up
A two step chromatographic procedure is applied: first alumina and then silica.

Quantification
Detection and quantification by GCMS with chemical ionization.

03 RESULTS

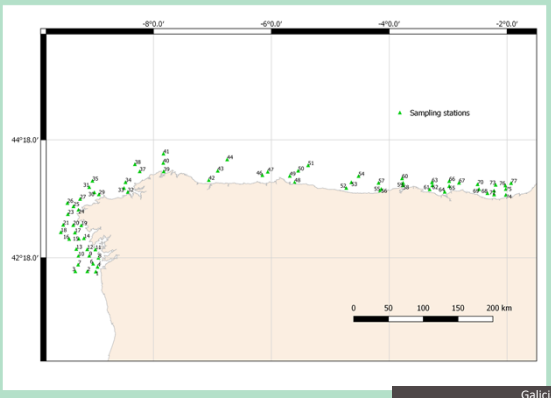

Figura 1. Sampling sites.

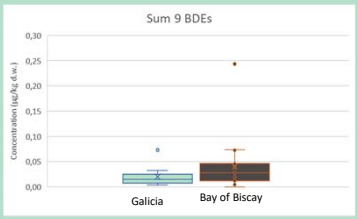

Figura 2. Box and whiskers plot of the sum of 9BDEs in Galicia and Bay of Biscay.

Table 1. Individual BDE congeners information: maximum and minimum in Galicia and Bay of Biscay and thresholds. In blue values under the BAC and in white values above BAC but below FEQG.

	Galicia		Bay of Biscay		Thresholds	
	Min	Max	Min	Max	BAC [1]	FEQG[2]
BDE28	<0.002	<0.002	<0.002	<0.002	0.05	110
BDE47	<0.002	0.029	<0.002	0.067	0.05	97.5
BDE66	<0.002	0.011	<0.002	0.007	0.05	97.5
BDE100	<0.002	0.007	<0.002	0.004	0.05	1.0
BDE85	<0.002	<0.002	<0.002	0.004	0.05	1.0
BDE99	<0.002	0.016	<0.002	0.015	0.05	1.0
BDE153	<0.002	0.004	<0.002	0.026	0.05	1100
BDE154	<0.002	0.008	<0.002	0.012	0.05	1100
BDE183	<0.002	0.008	<0.002	0.130	0.05	14000

1 OSPAR, 2020 a; 2 OSPAR, 2020b

04 CONCLUSIONS

BDEs are banned in Europe since 2004 but they are still detectable in the platform sediments.

Sampling sites are presented in the map presented in Figure 1.

In general, the values for the sum of 9 BDEs (BDE28, BDE47, BDE66, BDE85, BDE99, BD100, BD153, BDE154 and BD183) in the area of Galicia are lower than those in the Bay of Biscay as it is shown in Figure 2.

When comparing the concentrations measured in the sediments with international thresholds it can be seen than most values are under what is considered to be a reference value and some are above these concentrations.

All the sampling sites present concentrations well below the FEQGs so there are no expected biological effects caused by the presence of BDEs in the sediments.

05 ACKNOWLEDGEMENTS

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