

Interference of past soil contaminations on the biomonitoring of PCB emissions from a Recovered Derived Fuels (RDF) co-powered cement plant

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Supplementary materials

Supplementary Table S1. Resume of the studies carried between 2016 and 2019 aimed at assessing the distribution of polychloro byphenyls and polychloro dibenzo dioxins/furans near the main potential sources of the study area of Fig. 1, i.e. the cement plant and the industrial park.

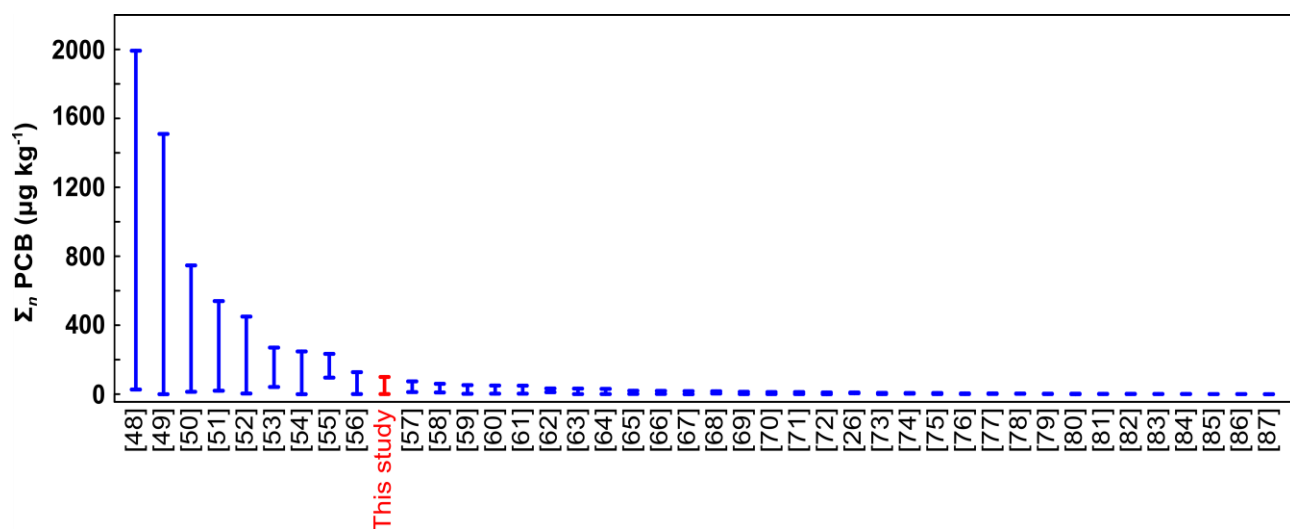
Study	Matrix	Area	Sites	Sampling design	Ancillary data
Grim 2016	Fat tissue of hens		18	Preferential	-
ARPA 2018	upper soils (0-5 cm) lower soils (10-25 cm)	28 km ²	11	Line transect sampling along fallout deposition gradients	Air particle distribution as predicted by atmospheric dispersion models simulating the emission from the cement plant and the industrial park
ARPA 2019a	eggs hen fodder	41 km ²	16 6	Random Preferential	-
ARPA 2019b	Air particulate		4	Preferential	PCB concentrations in stack emissions of the cement plant; inventory of PCB distribution in the Alpine regions

Supplementary Table S2. Summary of the polychlorinated biphenyls concentrations (pg ncm⁻¹) measured in stack emissions of the cement plant during February, July and October 2018 and May 2019. Congeners are order according to their homologous group: from tri- to epta-chlorinated biphenyls (3CB-7CB). Data from ARPA 2019a (see references). - : congener not measured

Homologous group / PCB congener	February 18	July 18	October 18	May 19
3CB				
28	-	-	-	2171.7
4CB				
52	-	-	-	2704.6
77	8.1	29.1	527.6	1559.7
81	2.1	4.8	121.2	51.9
5CB				
101	-	-	-	9677.3
105	14.8	31.5	48.8	1520.8
114	1.1	2.3	3.6	76.5
118	149	292	139.5	6968.8
123	5.3	16.4	21.2	206.1
126	2	2.5	3.4	239.9
6CB				
138	-	-	-	16307.7
153	-	-	-	19597
156	5.2	8.2	10.4	1012.6
157	1.4	2.3	2.7	99.8
167	2.4	5.9	6.6	619.7
169	0.7	1.2	0.8	3.9
7CB				
180	-	-	-	4544.3
189	0.8	0.9	1.5	31.1

Supplementary Table S3. Results of the regression analysis carried out between the distance of the cement plant and the industrial park from the 37 sampling sites of Fig. 1 and the concentration sums of the 12 dioxin-like (Σ_{12} DL-PCB), 20 non-dioxin-like (Σ_{20} NDL-PCB), and all 32 PCB congeners (Σ_{32} PCB) calculated for the *Robinia pseudoacacia* leaf samples. β_0 and β_1 are the regression parameters whereas R^2 is the coefficient of determination. Number in brackets are the p-value associated to regression parameters. Note that regression parameters are not significant and that R^2 is very low.

	Σ_{12} DL-PCB	Σ_{20} NDL-PCB	Σ_{32} PCB
Cement-plant			
β_0	21.09 (0.306)	4.91 (0.229)	17.88 (0.280)
β_1	-0.004 (0.664)	0.000 (0.929)	-0.003 (0.696)
R^2	0.016	0.001	0.009
Industrial park			
β_0	12.76 (0.533)	4.49 (0.253)	9.70 (0.560)
β_1	0.000 (0.989)	0.000 (0.827)	0.001 (0.877)
R^2	0.000	0.007	0.001



Supplementary Figure S1. Comparison between the range of PCB concentration values measured in *Robinia pseudoacacia* samples (this study, in red) and those reported in other 41 studies based on the use of leaves of deciduous broadleaved, evergreen broadleaved and coniferous species as biomonitor of airborne PCB.