Article

Sixteen Years of Mercury Biomonitoring around A Waste Incinerator: Methodological Implications of Using Epiphytic Lichens and Vascular Plants as Biomonitors

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Supplementary Material

Sample treatment

SM1.1 X. parietina *samples*

Samplings of BS_{1999} and BS_{2007} were carried out between May 1999 and September 1999 and between the January 26th and February the 3rd 2007, respectively. Autochthonous lichen material was sampled by means of stainless knife from sub-vertical, healthy trees at a minimum height of 70 cm from the ground level. Once sampled, lichen material were stored in plastic petri and transported to the laboratory, where they let dry out for 24 h at room temperature. Then, a meticulous sample preparation under a stereomicroscope was performed in order to remove bark debris, extraneous epiphytic organisms and to select only the last 1.5 – 4 mm from marginal thallus tip, i.e. the peripheral lobes approximately grown in the last year before sampling (see [24]). Finally, samples composed by 100-150 mg of marginal lobes were first powdered in agate mortar with liquid nitrogen, dried over silica at room temperature, and then stored in Eppendorf tubes until chemical analysis.

SM1.2 P. furfuracea *transplants*

Transplant survey (herein named as BS_{2008}) was carried out by exposing three *P. furfuracea* samples, in each of the 30 exposure sites (see section 2.2; Figure 1d). Details about lichen collection, sample pre-treatment and sample exposure are reported in [14, 18]. Each of the three samples exposed in a single site was retrieved after 6, 12 and 24 weeks periods, respectively. The material from each site was closed in a plastic envelope and transported to the laboratory, where ca. 300 mg of the most external lobe portions were cut with porcelain scissors and treated for chemical analysis as explained for *X. parietina* samples.

SM1.3 R. pseudoacia *samples*

Details about the treatment and powdering of *R. pseudoacacia* leaf samples collected in 2008 are reported in [18]. In 2014 and 2015, the sample collection of *R. pseudoacacia* leaves were carried out at 39 sampling sites by selecting ca. 20-30 leaves from three leaf rachis each of which was collected from a different tree. In the laboratory, leaves samples were let to dry out over silica gel for 24 h. Leaves samples were powdered at 600 rpm for 2 min with a planetary mill (Retch PM 100) equipped with zircon balls. Finally, powdered samples were subdivided into three aliquots, which were stored in Eppendorf tubes until chemical analysis.

Table S1: List of standard reference material (SRM) and certified reference material (CRM) used to estimates the accuracy of chemical analyses of collected or exposed samples in the five BSs presented in this work.

Series of samples	SRM and/or CRM
Xp$_{1999}$	SRM n° 1573a "Tomato leaves" provided by NIST, Gaithersburg,USA
Xp$_{2007}$	IAEA-336, "Lichen", International Atomic Energy Agency, Analytical Quality Control Services Austria; GBW 07604, "Poplar leaves", National Research Center, for Certified References Materials, Institute of Geophysical and Geochemical exploration, Cina CRM-482, "Lichen", Commission of the European Communities, Community Bureau
Pf 6$_{2008}$	CRM-482, "Lichen", Commission of the European Communities, Community Bureau
Pf 12$_{2008}$	CRM-482, "Lichen", Commission of the European Communities, Community Bureau
Pf 24$_{2008}$	CRM-482, "Lichen", Commission of the European Communities, Community Bureau
Rp$_{2008}$	CRM-482, "Lichen", Commission of the European Communities, Community Bureau
Rp-G$_{2014}$	M2 and M3 standards, *Pleurozium schreberi*, Steiness et al. 1997
Rp-Y$_{2014}$	M2 and M3 standards, *Pleurozium schreberi*, Steiness et al. 1997
Rp$_{2015}$	M2 and M3 standards, *Pleurozium schreberi*, Steiness et al. 1997

Table S2. setting parameters and variogram equations used in the six kriging interpolation analyses. Log: log transformation of the data; Cell size: measure of the side of a squared area where the interpolation value is predicted; Search range: algorithm used in Krigin interpolation analyses; Variogram equation: equation used to fit the variogram; R^2: coefficient of determination of fitting curves; Fitting range: spatial range of the variogram fitting equation; Lag distance: distance between pairs of sampling sites used to calculate the variogram; Maximum distance: maximum values of Lag distance.

Set of samples	Log	Cell size	Search range	Variogram equation	R^2	Fitting range	Lag distance	Maximum distance
		m				*m*	*m*	*m*
Xp$_{1999}$	No	500	Global	$Y=a+bx$	79.31%	18800	500	20000
Xp$_{2007}$	No	500	Global	$Y=a+bx+cx^2+dx^3$	80.89%	18400	500	20000
Pf 6$_{2008}$	Yes	500	Global	$Y=a+bx+cx^2+dx^3$	68.56%	12731	500	13710
Pf 12$_{2008}$	Yes	500	Global	$Y=a+bx+cx^2+dx^3$	70.68%	12731	500	13710
Pf 24$_{2008}$	Yes	500	Global	$Y=a+bx+cx^2+dx^3$	62.79%	10000	500	10000
Rp$_{2014}$	Yes	500	Global	$Y=a+bx+cx^2+dx^3$	76.47%	10000	400	10000