



## Supplementary Materials

**Table S1.** Statistical summary of the Igeo values of Pb and Cd in riparian soils and river sediments from BJR, DJR and XJR (mg/kg).

Geo-accumulation index (Igeo)		Pb			Cd		
		BJR	DJR	XJR	BJR	DJR	XJR
Riparian soils	Min	-0.29	-0.55	-0.82	-2.1	-0.64	-0.69
	Max	1.44	0.61	1.16	3.79	2.14	3.39
	Mean	0.65	-0.14	0.22	1.82	0.25	2.01
	SD	0.61	0.37	0.61	1.76	0.81	1.26
River sediments	Min	-0.21	-0.78	-0.94	1.51	-0.31	0.04
	Max	1.62	-0.73	0.6	4.42	3.41	3.28
	Mean	0.84	-0.04	-0.16	3.23	0.8	2.18
	SD	0.56	0.59	0.46	0.78	1.15	1.16

**Table S2.** Pb and Cd contents in sediments of major rivers in the world.

River	Country	Pb (mg/kg)	Cd (mg/kg)
Korotoa [1]	Bangladesh	36-83	0.26-2.8
Ganga [2]	India	148.8-211.4	9.5-79
Sungai [3]	Malaysia	43.4-320	0.2-0.5
Detroit [4]	America	14.5-20.2	1.2-1.6
Ebro [5]	Spain	5.36-33.2	0.10-23.7
Magdalena [6]	Colombia	12.1-18.1	0.11-3.95
Haihe River [7]	China	41.27	0.36
Liaohe River [8]	China	11.54	1.15
Yangtze River [9]	China	39.32	0.4
Xiangjiang River [10]	China	150.3	15.43
Yellow River [11]	China	24.13	0.19
Pearl River (this study)	China	73.07	0.94

**Table S3.** Pb isotopic ratios of  $^{206}\text{Pb}/^{207}\text{Pb}$  and  $^{208}\text{Pb}/^{207}\text{Pb}$  from industrial, agricultural and natural end members.

Source	Sample description	$^{206}\text{Pb}/^{207}\text{Pb}$	$^{208}\text{Pb}/^{207}\text{Pb}$	Reference
Industrial-end member	Pb ore in Guangdong	1.172	2.473	Zhu et al., 2001 [16]
	Dockyard dusts	1.176	2.461	Bi et al., 2013 [12]
	Ironworks dusts	1.178	2.468	Bi et al., 2013 [12]
	Power station dusts	1.173	2.467	Zhu et al., 2001 [16]
	Vehicle exhausted deposits	1.16	2.423	Zhu et al., 2001 [16]
	Hardware factory dusts	1.164	2.46	Zhu et al., 2001 [16]
	Plastic factory dusts	1.161	2.461	Zhu et al., 2001 [16]
Agricultural-end member	Vegetable soils	1.191	2.503	Luo et al., 2012 [14]
	Orchard soils	1.189	2.485	Luo et al., 2012 [14]
	Residual fractions of natural soils	1.203	2.528	Wong et al., 2002 [15]
	Residual fractions of crop soils	1.198	2.517	Wong et al., 2002 [15]
	Residual fractions of paddy soils	1.191	2.524	Wong et al., 2002 [15]
Natural-end member	Granitic rocks	1.184	2.482	Zhu et al., 1998 [17]
	Volcanic rocks	1.199	2.497	Zhu et al., 1989 [18]
	Suburb uncontaminated soils	1.195	2.482	Zhu et al., 2001 [16]
	Alluvial soils	1.196	2.487	Han et al., 2018 [13]

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