

Environ Geochem Health

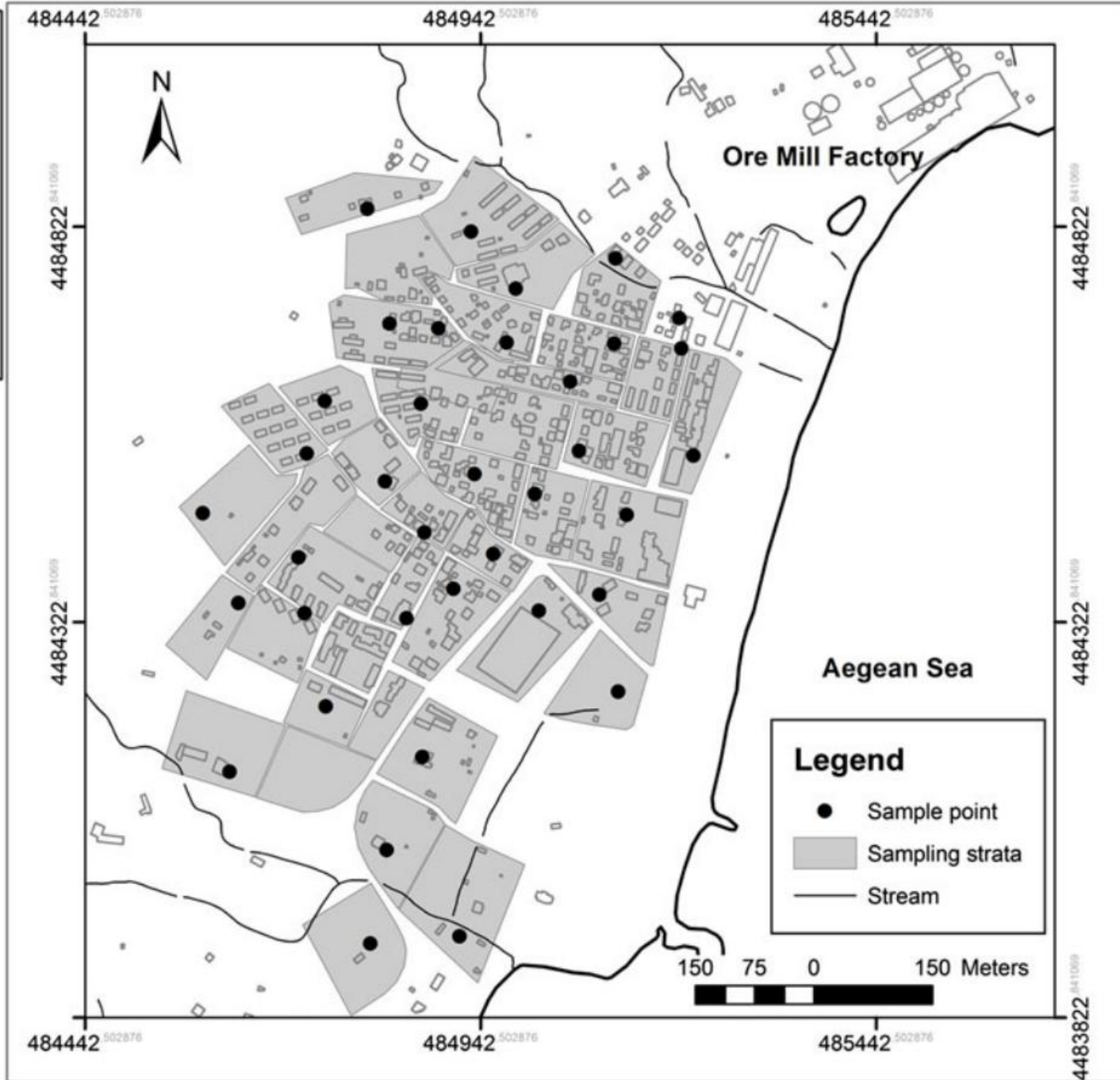
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ORIGINAL PAPER

# **Garden soil and house dust as exposure media for lead uptake in the mining village of Stratoni, Greece**

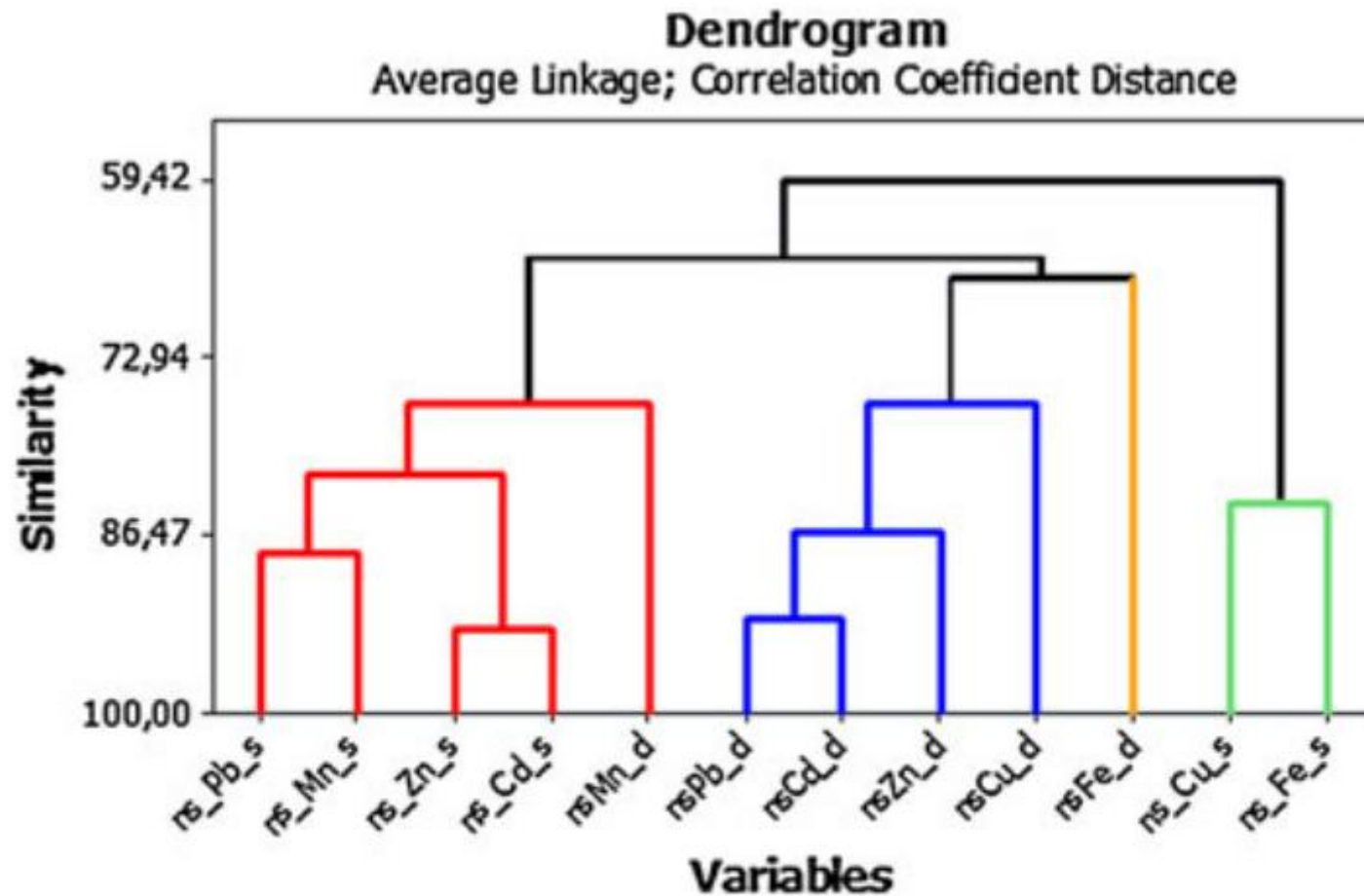
**Ariadne Argyraki**



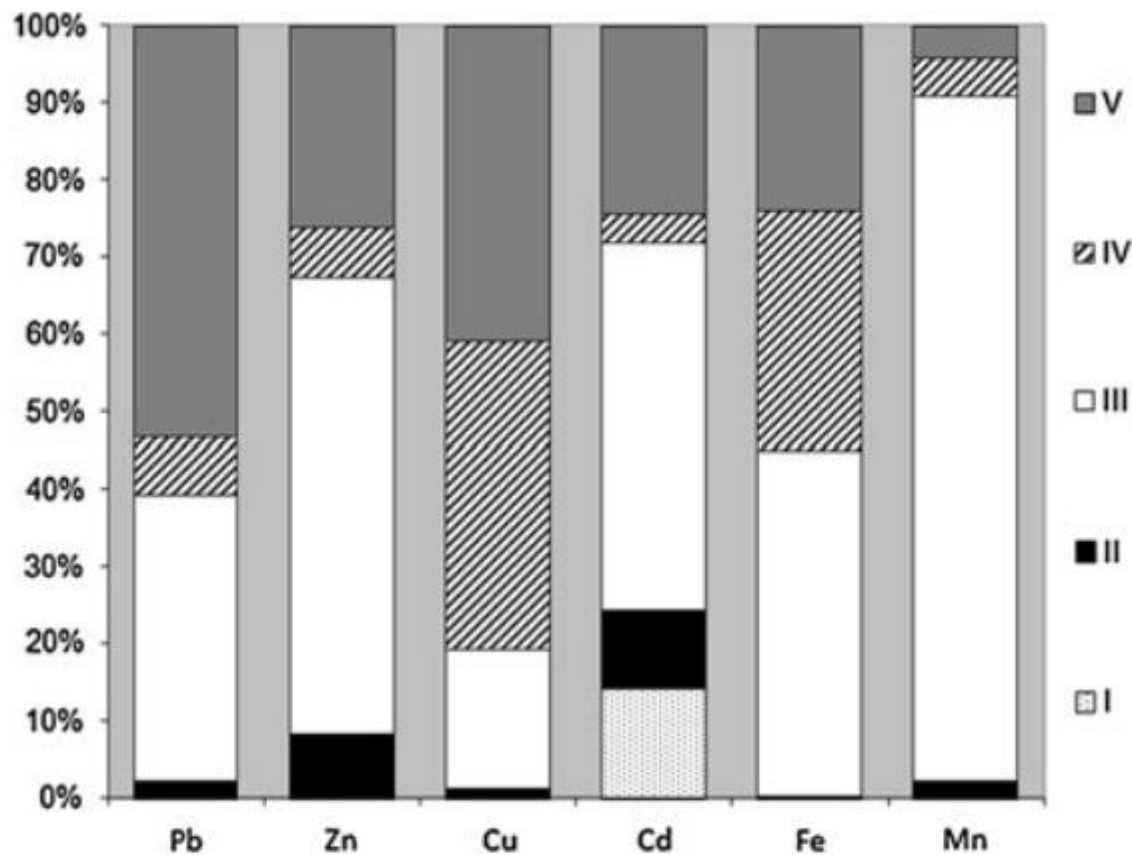
**Table 1** Total concentrations (mg/kg) of Pb and other PHE in soil and in house dust samples from Stratoni

	Pb	Zn	Cu	Cd	As	Fe	Mn
Soil samples ( <i>n</i> = 38)							
Mean	1,090	878	184	6	403	45,700	4,470
Median	1,070	712	184	6	296	45,100	2,940
St. Dev.	390	569	50	3	359	921	4,370
% RSD	36	65	27	50	89	2	98
Min	124	133	45	2	23	23,800	394
Max	2,042	2,520	285	15	1,690	73,800	19,800
Dust samples ( <i>n</i> = 30)							
Mean	1,660	2,720	446	10		22,900	1,250
Median	990	1,970	164	7.2		21,600	998
St. Dev.	1,550	2,050	1,500	7.1		8,970	825
% RSD	93	76	336	71		39	66
Min	390	839	71	3		7,710	506
Max	6,920	6,920	8,390	28		59,500	5,090
SBG	895	654	150	3.3	364	61,200	3,037
ES	23	52	13	0.1	7	31,600	503
GD	5.9	475	79.9	0.86	2.09		109
D/S	1.5	3.1	2.4	1.7		0.5	0.3
S/SBG	1.3	1.4	1.2	2.2		0.8	1.6
D/SBG	1.9	4.2	3.0	3.4		0.4	0.4

SBG, regional soil background after Kelepertsis et al. (2006); ES, average European levels in soil after Salminen et al. (2005); GD, average levels in house dust from Germany after Seifert et al. (2000); D, concentration in Stratoni house dust; S, concentration in Stratoni soil

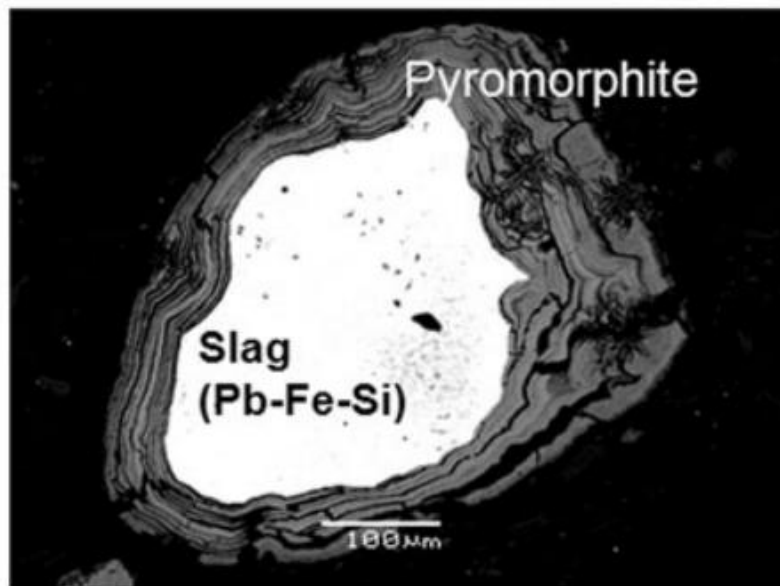
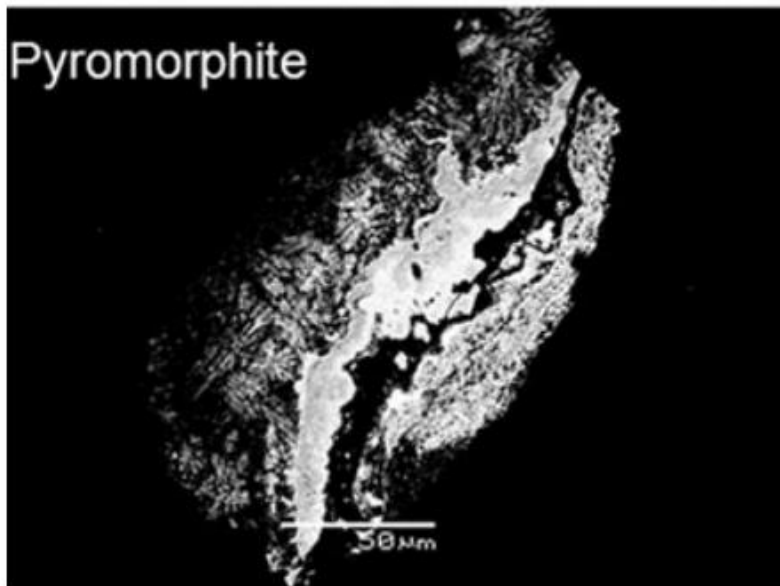
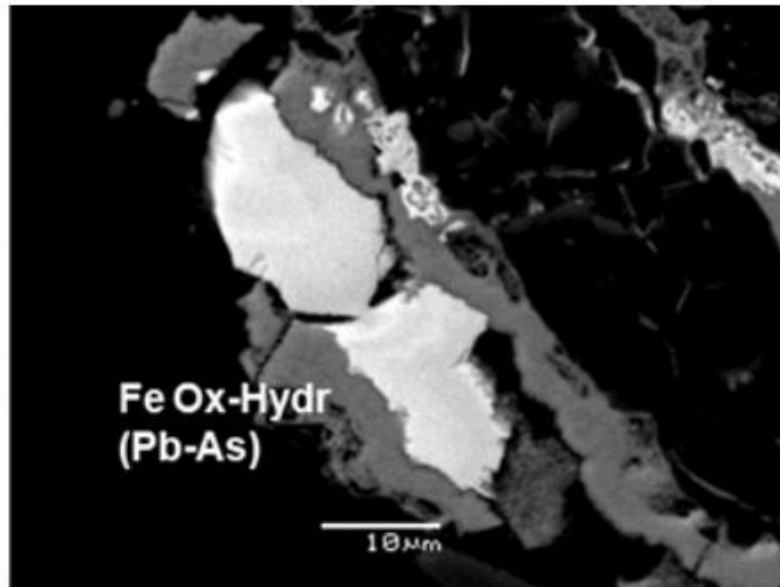
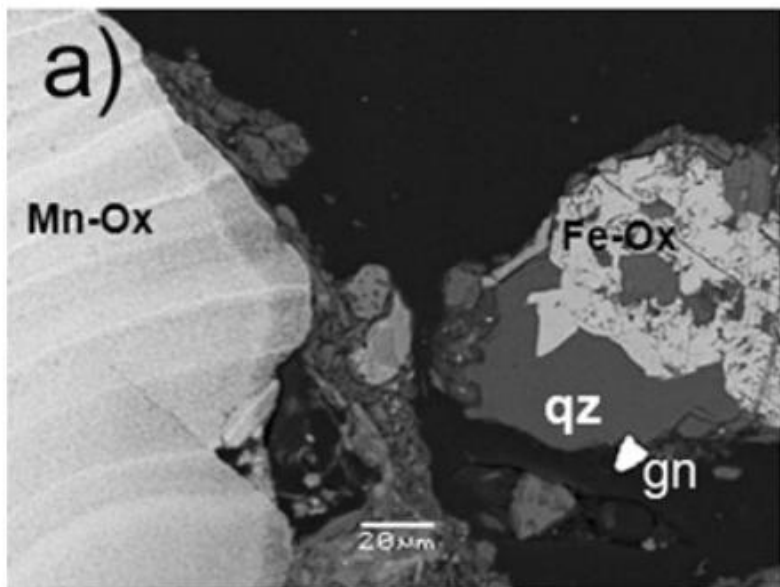


**Fig. 3** Dendrogram showing association of elements in soil (parameter\_s) and dust (parameter\_d) samples based on normal scores of the measured values

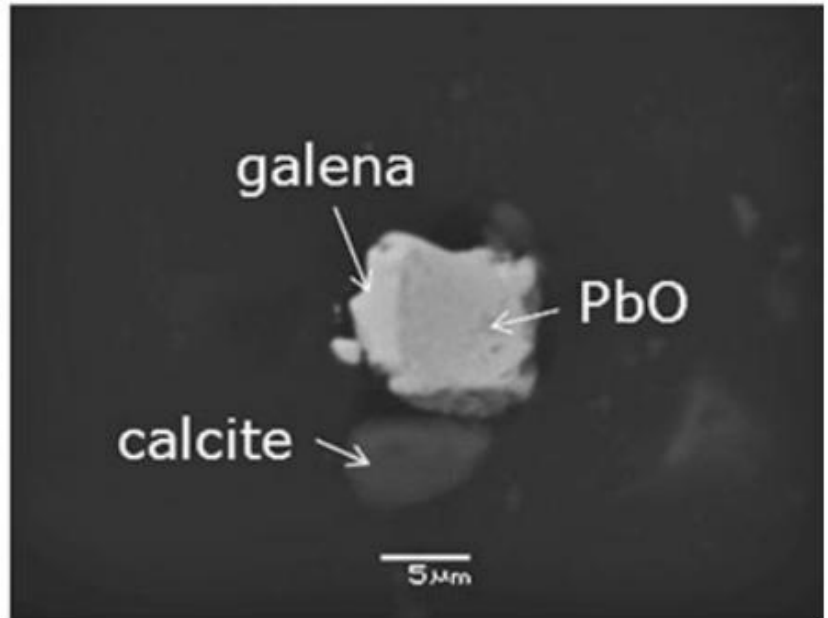
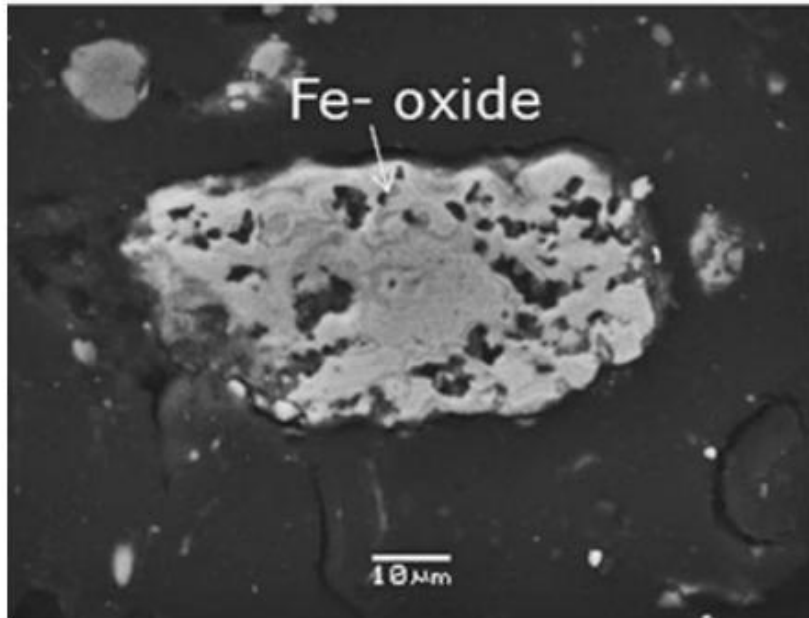
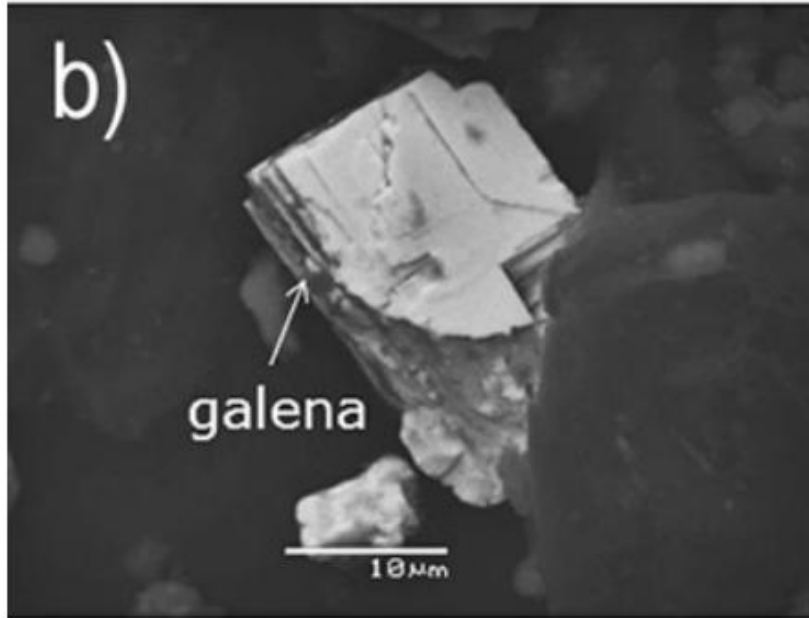


**Fig. 6** Partition (%) of heavy metals in five operationally defined soil phases ( $n = 10$ ). *I* exchangeable, *II* carbonate and specifically adsorbed, *III* reducible, *IV* oxidisable, *V* residual

## Ορυκτολογία εδάφους



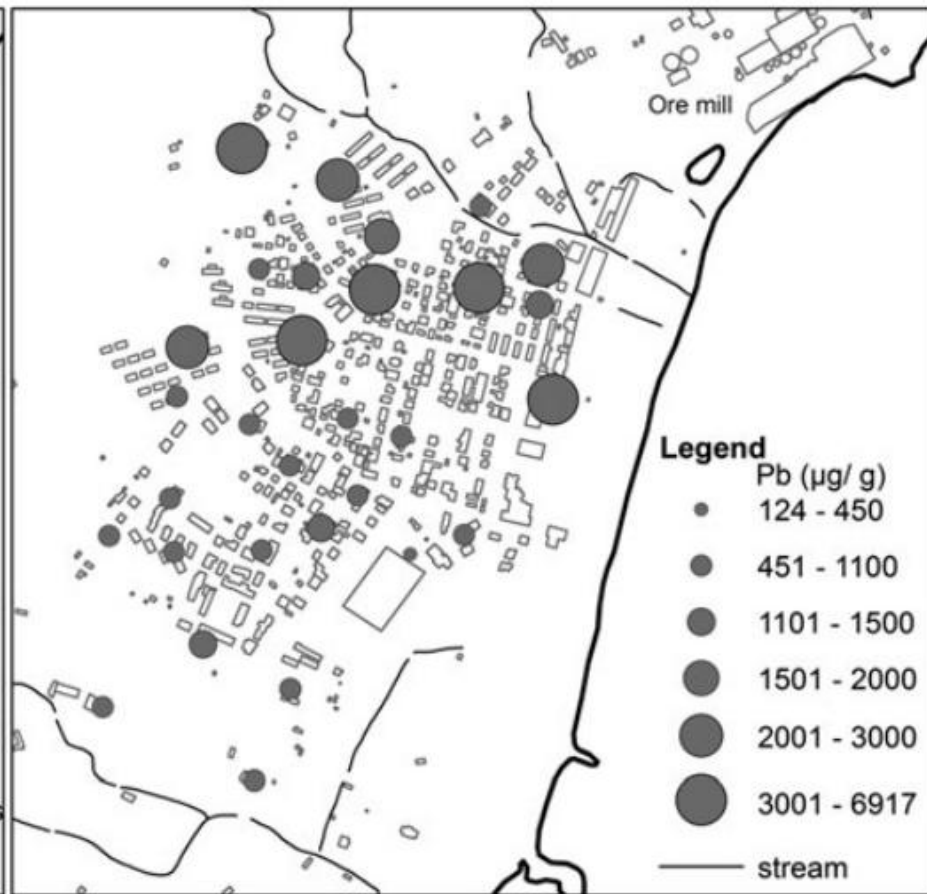
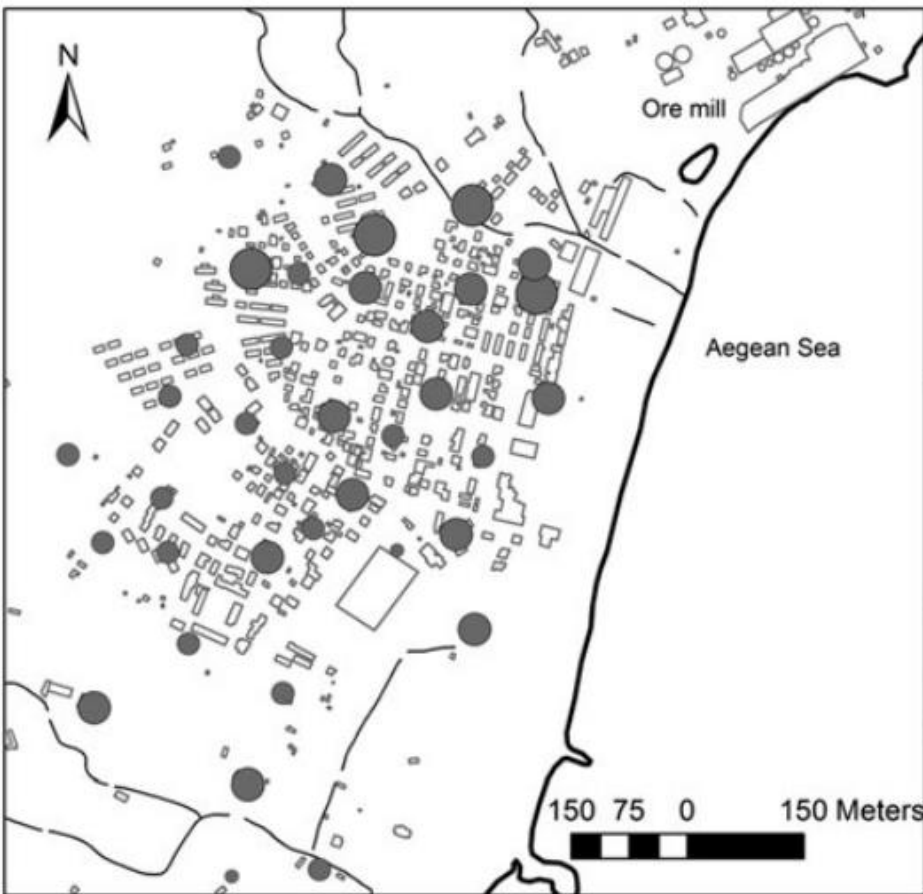
# Ορυκτολογία σκόνης



# Χάρτες συγκέντρωσης

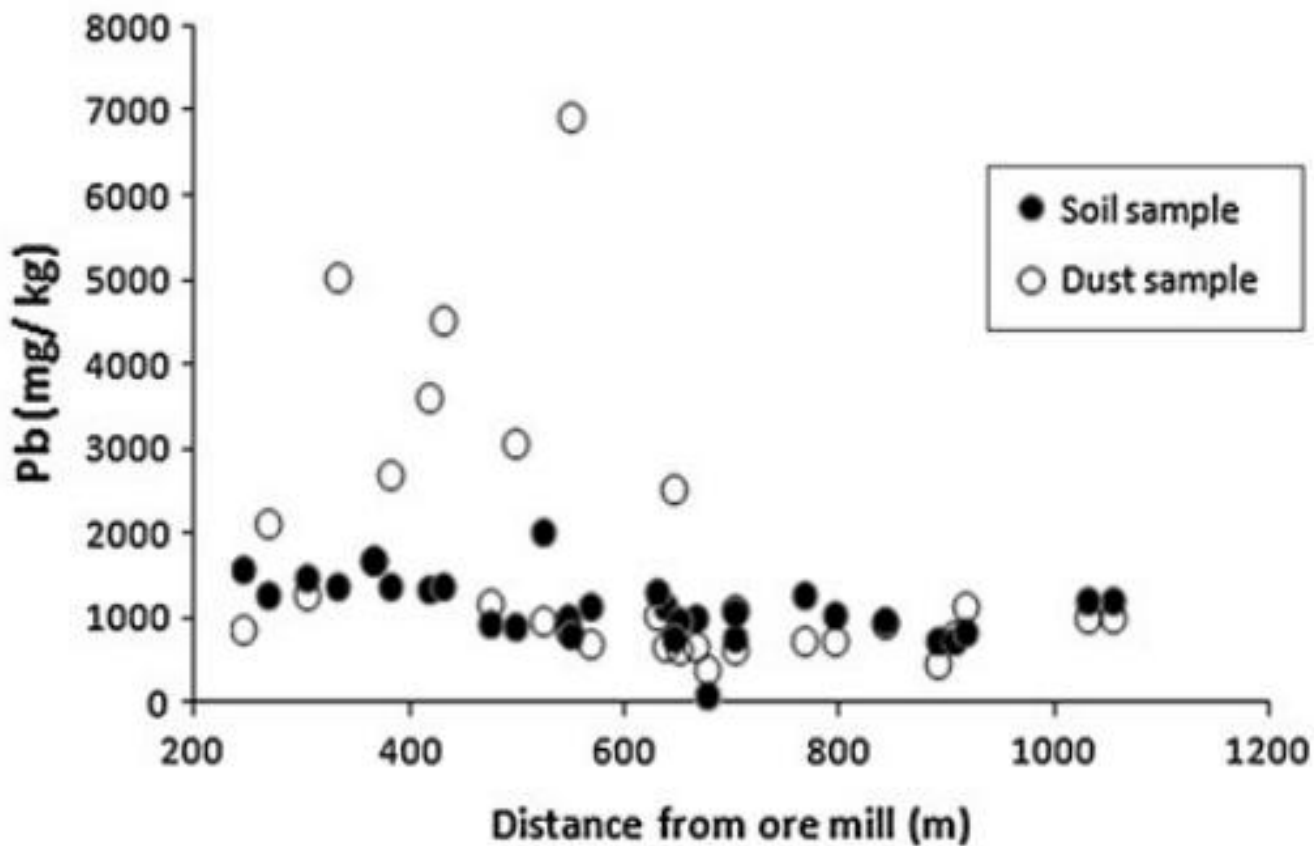
έδαφος

σκόνη





## Μεταβολή συγκέντρωσης-απόστασης από την πηγή



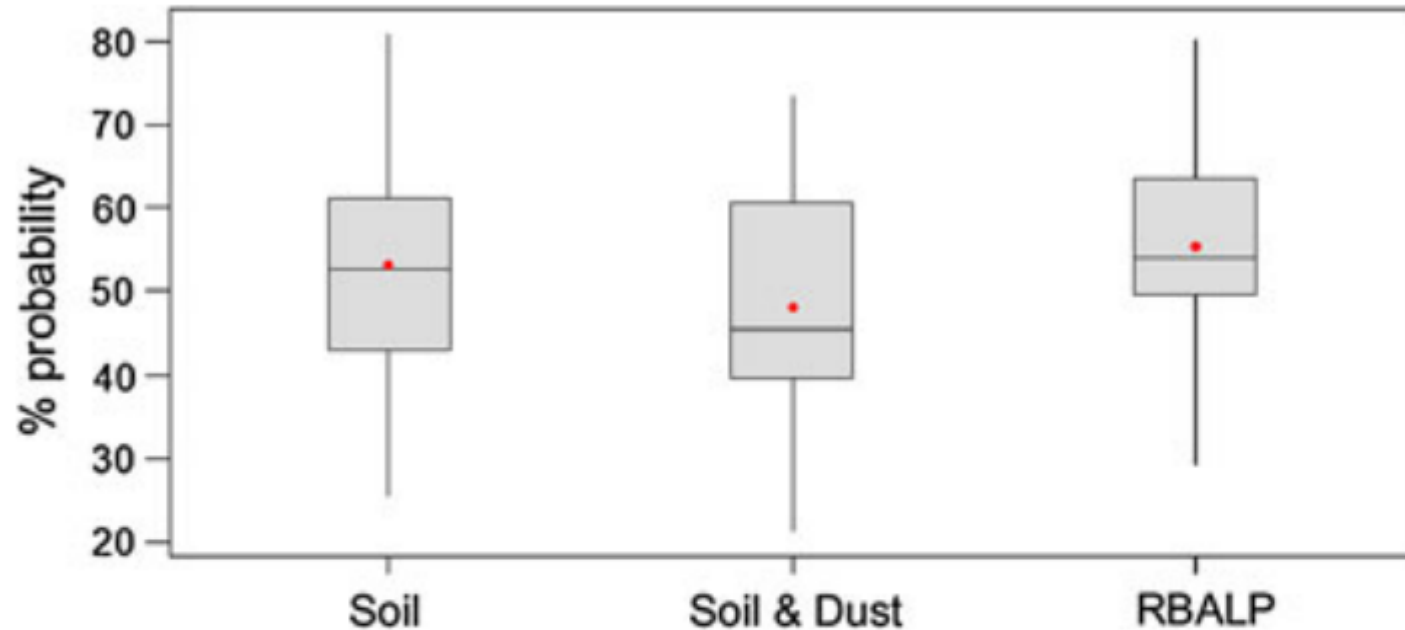
## Βιοπροσβασιμότητα Pb

**Table 2** Bioaccessibility test results for Pb in soil and dust of ten samples at Stratoni

Sample	Soil				Dust			
	Total Pb (mg/kg)	RBALP Pb (mg/kg)	IVBA (%)	RBA (%)	Total Pb (mg/kg)	RBALP Pb (mg/kg)	IVBA (%)	RBA (%)
1	1,240	697	56	49	986	731	74	65
2	124	48	39	34	390	186	48	42
3	1,040	432	42	37	661	314	48	42
4	753	209	28	24	458	213	47	41
5	3,740	2,150	58	50	1,670	723	43	38
6	765	390	51	45	798	334	42	37
7	1,610	533	33	29	847	348	41	36
8	2,040	236	12	10	973	332	34	30
9	927	252	27	24	3,060	1,000	33	29
10	1,410	406	29	25	5,010	1,090	22	19
Mean	1,370	535	37	33	1,486	528	43	38
St.Dev.	986	596	15	13	1,464	332	14	12

*RBALP* relative bioaccessibility leaching procedure; *IVBA* in vitro bioaccessibility; *RBA* relative bioaccessibility

## Πρόβλεψη πιθανότητας αυξημένου Pb στο αίμα



**Fig. 7** *Boxplots* comparing the IEUBK predicted probability of blood-Pb to exceed 10  $\mu\text{g}/\text{dl}$ , for three runs taking into account: (a) Pb total soil concentrations (Soil), (b) Pb total concentrations in soil and dust (soil and dust), (c) Pb in vitro bioaccessibility test results (RBALP).  $n = 10$