

Supplementary Materials

Accumulation and ecological risk assessment of arsenic and heavy metals in sediments affected by gold mining in karst areas of Southwest China

Sirui Chen^{a,b}, Pan Wu^{a,b,*}, Xuefang Cha^{a,b}, Binghuang Zhou^{a,b}, Jingbin Liu^{a,b}, En Long^{a,b}

^a College of Resources and Environmental Engineering, Guizhou University, Guiyang 550025, China

^b College Key Laboratory of karst geological resources and environment of Ministry of education, Guiyang 550025, China

* Corresponding author: Pan Wu

Email: pwu@gzu.edu.cn

The following supplementary material is available for this article online:

Table S1. As and HMs concentration (mg/kg), pH value in sediment samples, and lithology of the area.

Table S2. Statistical results of concentration (mg/kg) and pH of As and HMs in sediment samples and their corresponding BV.

Table S3. Pearson correlation matrix of As and HMs in sediments.

Table S1. As and HMs concentration (mg/kg), pH value in sediment samples, and lithology of the area.

Sample number	Lithology of the area	Cr	Co	Ni	Cu	Zn	As	Cd	Sb	Pb	pH
SZ											
SZ1	Oolitic limestone	407.51	57.78	125.43	121.18	195.42	46.54	1.00	2.68	24.26	6.94
SZ2	Sand-mudstone	224.53	32.05	66.30	99.85	209.56	223.17	0.88	16.62	23.18	7.03
SZ3	Oolitic limestone	329.90	59.01	109.01	126.04	151.49	135.15	0.76	9.06	19.59	7.16
SZ4	Oolitic limestone	309.76	57.20	116.32	123.20	160.82	109.91	0.82	8.31	19.97	6.94
SZ5	Oolitic limestone	317.09	61.86	119.57	122.83	159.68	134.09	0.75	8.06	24.78	7.55
HS											
HS1	Oolitic limestone	439.06	72.27	123.10	136.13	166.62	23.66	0.93	1.18	24.19	7.13
HS2	Oolitic limestone	473.69	68.72	121.67	128.96	151.90	21.23	0.85	1.08	23.70	7.23
HS3	Oolitic limestone	228.75	35.07	83.91	101.98	149.51	29.60	0.85	6.28	26.90	6.94
HS4	Oolitic limestone	219.60	54.13	168.32	126.53	210.40	88.34	1.66	3.71	23.65	7.58
TC											
TC1	Oolitic limestone	149.20	31.59	60.34	72.68	175.10	16.81	0.71	0.43	39.37	7.74
TC2	Sand-mudstone	216.80	36.13	89.49	138.97	126.94	42.42	0.94	2.16	26.50	7.4
TC3	Sand-mudstone	217.76	55.05	85.83	113.90	158.30	456.73	0.95	4.75	18.05	7.52
TC4	Sand-mudstone	164.83	55.59	123.55	111.65	189.85	1870.80	1.06	14.79	16.93	7.92
TC5	Oolitic limestone	290.08	59.31	142.26	126.19	195.34	884.23	1.11	6.47	22.53	7.18
TC6	Oolitic limestone	243.70	43.72	93.69	118.29	163.33	885.58	0.83	8.49	22.19	7.2
TC7	Claystone	313.50	58.35	125.27	101.84	195.37	312.09	0.91	3.84	24.20	7.66
TC8	Claystone	152.58	32.75	67.87	70.44	341.72	26.11	1.12	1.70	40.14	7.97

Table S1. (Continued) As and HMs concentration (mg/kg), pH value in sediment samples, and lithology of the area.

Sample number	Lithology of the area	Cr	Co	Ni	Cu	Zn	As	Cd	Sb	Pb	pH
SB											
SB1	Oolitic limestone	220.59	44.08	94.01	92.81	111.19	24.62	0.56	0.94	19.10	7.35
SB2	Oolitic limestone	347.52	56.42	105.02	123.96	142.42	92.41	0.91	1.94	23.35	8.68
SB3	Oolitic limestone	325.54	52.16	114.79	123.57	151.58	13.46	0.78	1.00	21.30	7.27
SB4	Sand-mudstone	292.19	47.81	66.46	101.12	149.38	242.78	0.78	6.51	19.94	7.44
SB5	Oolitic limestone	336.89	51.94	84.75	95.65	129.56	38.43	0.65	1.56	20.00	7.32
SB6	Claystone	282.24	44.20	100.50	102.10	211.28	46.83	0.77	1.65	19.40	7.14
M											
M1	Sand-mudstone	249.66	39.75	81.56	94.89	259.42	1530.83	1.19	7.21	18.80	6.23
M2	Sand-mudstone	125.77	33.31	75.96	100.56	160.91	8170.25	0.99	70.74	15.90	8.39

Table S2. Statistical results of concentration (mg/kg) and pH of As and HMs in sediment samples and their corresponding BV.

	Cr	Co	Ni	Cu	Zn	As	Cd	Sb	Pb	pH
SZ										
Min	224.53	32.05	66.30	99.85	151.49	46.54	0.75	2.68	19.59	6.94
Max	407.51	61.86	125.43	126.04	209.56	223.17	1.00	16.62	24.78	7.55
Mean±SD	317.76±65.11	53.58±12.17	107.33±23.69	118.62±10.64	175.39±25.49	129.77±63.43	0.84±0.10	8.95±4.98	22.36±2.43	7.12±0.25
HS										
Min	219.60	35.07	83.91	101.98	149.51	21.23	0.85	1.08	23.65	6.94
Max	473.69	72.27	168.32	136.13	210.40	88.34	1.66	6.28	26.90	7.58
Mean±SD	340.28±134.86	57.55±16.91	124.25±34.53	123.40±14.85	169.61±28.23	40.71±31.95	1.07±0.39	3.06±2.46	24.61±1.55	7.22±0.27
TC										
Min	149.20	31.59	60.34	70.44	126.94	16.81	0.71	0.43	16.93	7.18
Max	313.50	59.31	142.26	138.97	341.72	1870.80	1,12	14.79	40.14	7.97
Mean±SD	218.56±61.89	46.56±11.87	98.54±29.08	106.75±24.28	193.24±64.26	561.85±638.01	0.95±0.14	5.33±4.64	26.24±8.89	7.57±0.30
SB										
Min	220.59	43.10	66.46	92.81	93.69	13.46	0.56	0.94	19.10	7.14
Max	347.52	56.42	114.79	123.96	211.28	242.78	0.98	6.51	29.02	8.68
Mean±SD	300.83±46.80	49.44±4.92	94.26±16.26	106.54±13.78	149.24±33.87	76.42±85.90	0.74±0.12	2.27±2.11	20.52±1.58	7.53±0.57
M										
M1	249.66	39.75	81.56	94.89	259.42	1530.83	1.19	7.21	18.80	6.23
M2	125.77	33.31	75.96	100.56	160.91	8170.25	0.99	70.74	15.90	8.39
BV	95.9	19.2	39.1	32.0	99.5	20.0	0.66	2.24	35.20	
Mean (All) ±SD	273.15±88.47	49.61±11.77	101.80±26.50	111.01±17.95	176.68±47.28	618.64±1646.78	0.91±0.22	7.65±13.82	23.12±5.77	7.39±0.50

BV: HMs soil background value of Guizhou Province

Table S3. Pearson correlation matrix of As and HMs in sediments

	Cr	Co	Ni	Cu	Zn	As	Cd	Sb	Pb
Cr	1								
Co	0.791★★	1							
Ni	0.389	0.701★★	1						
Cu	0.535★★	0.632★★	0.654★★	1					
Zn	-0.291	-0.222	-0.018	-0.427	1				
As	-0.418	-0.279	-0.164	-0.095	0.006	1			
Cd	-0.208	0.096	0.532★	0.245	0.548★	0.151	1		
Sb	-0.421	-0.296	-0.176	-0.088	-0.042	0.989★★	0.130	1	
Pb	-0.190	-0.348	-0.263	-0.404	0.430	-0.377	0.033	-0.355	1

★Correlated: $p < 0.05$

★★Significantly correlated: $p < 0.01$