Supplementary Material

Metal contents and pollution indices assessment of surface water, soil and sediment from the Aries River basin mining area, Romania

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This online resource contains the following data:
1. Sampling location associated with the sampled matrices.
2. The total metal and metalloid element content (mg/L) of the surface water samples from the sampling stations (1-23), highlighted with different colors (Excel, Conditional Formatting tool) in order to show the highest, medium and lowest concentration variation in each metal column (from highest, red-orange-yellow-green, to lowest values) between the sampling locations.
3. The total metal and metalloid element content (mg/kg DW) of the soil samples from the sampling stations (1-23), highlighted with different colors (Excel, Conditional Formatting tool) in order to show the highest, medium and lowest concentration variation in each metal column (from highest, red-orange-yellow-green, to lowest values) between the sampling locations.
4. The total metal and metalloid element content (mg/kg DW) of the sediment samples from the sampling stations (1-23), highlighted with different colors (Excel, Conditional Formatting tool) in order to show the highest, medium and lowest concentration variation in each metal column (from highest, red-orange-yellow-green, to lowest values) between the sampling locations.
5. The pollution indices of the surface water sampled from the Arieș River basin.
6. Pollution and metal contamination assessing based on the indices values.
7. Comprehensive pollution indices of the analyzed metals in soil and sediment samples.

Table S1. Sampling locations associated with the sampled matrices.

	Sampling site (location)	Surface water sampling code	Soil sample code	Sediment sample code
1	Arieșul Mare River, upstream Albac village	A1	S1	Sed1
2	Arieșul Mare River, downstream Albac village	A2	S2	Sed2
3	Arieșul Mic River, Dos village	A3	S3	Sed3
4	Arieș River, upstream Câmpeni village	A4	-	-
5	Roșia Rivulet, Roșia Montană village	A5	-	-
6	Roșia Rivulet, downstream Roșia Montană village	A6	S6	Sed6
7	Abrud River, upstream Cărpeniș village	A7	S7	Sed7
8	Abrud River, downstream Cărpeniș village	A8	S8	Sed8
9	Arieș River, downstream Bistra village	A9	S9	Sed9
10	Garda Rivulet, Lazuri village	A10	-	-
11	Șesii Valley, dam	A11	S11	Sed11
12	Șesii Valley, basin	A12	-	-
13	Arieș River, downstream Lupșa village	A13	-	-
14	Arieș River, downstream Baia de Arieș town	A14	S14	Sed14
15	Arieș River, upstream Sălciua de Jos village	A15	-	-
16	Arieș River, Poşaga de Jos village	A16	S16	Sed16
17	Arieș River, downstream Buru village	A17	S17	Sed17
18	Arieș River, Mihai Viteazu village	A18	S18	Sed18
19	Arieș River, Turda city	A19	-	-
20	Arieș River, upstream Câmpia Turzii city	A20	S20	Sed20
21	Arieș River, downstream Câmpia Turzii city	A21	S21	Sed21
22	Arieș River, downstream Luncani village	A22	S22	Sed22
23	Arieș River, Gura Arieșului village	A23	S23	Sed23

Table S2. The total metal and metalloid element content (mg/L) of the surface water samples from the sampling stations (1-23), highlighted with different colors (Excel, Conditional Formatting tool) in order to show the highest, medium and lowest concentration variation in each metal column (from highest, red-orange-yellow-green, to lowest values) between the sampling locations.

Sampling station	*Fe*	*Na*	*Mg*	*K*	*Ca*	*Ni*	*Cr*	*Cu*	*Zn*	*Cd*	*Pb*	*Mn*	*Al*	*As*	*Hg*
	mg/L														
A1	<0.01	6.12	3.11	0.812	30.4	0.020	<0.02	0.027	<0.02	<0.02	0.047	<0.01	0.087	0.001	<0.01
A2	0.035	6.22	3.25	0.795	35.7	0.017	<0.02	0.026	<0.02	<0.02	0.033	<0.01	0.089	0.001	<0.01
A3	0.016	2.47	2.74	0.642	27.9	0.024	<0.02	0.022	0.033	<0.02	0.04	<0.01	0.062	0.001	<0.01
A4	0.022	5.82	2.55	0.784	28.2	0.029	<0.02	0.018	<0.02	<0.02	0.028	<0.01	0.07	0.001	<0.01
A5	0.018	9.05	9.12	5.17	65.8	0.044	<0.02	0.034	0.187	<0.02	0.028	0.043	0.084	0.001	<0.01
A6	8.73	10.7	18.3	3.88	97.4	0.111	<0.02	0.208	4.22	0.021	0.118	22.4	22.8	0.002	<0.01
A7	0.124	9.77	6.82	2.21	50.8	0.070	<0.02	0.035	0.107	<0.02	<0.01	0.027	0.687	0.001	<0.01
A8	0.055	10.2	7.42	1.97	50.1	0.022	<0.02	0.03	0.154	<0.02	0.051	2.48	0.124	0.002	<0.01
A9	0.017	6.24	4.12	1.55	38.7	0.028	<0.02	0.028	0.02	<0.02	0.076	0.512	0.107	0.002	<0.01
A10	0.016	7.55	5.08	1.48	30.1	<0.01	<0.02	0.022	<0.02	<0.02	<0.01	<0.01	0.097	0.002	<0.01
A11	0.028	5.47	3.37	2.56	219	<0.01	<0.02	0.018	<0.02	<0.02	<0.01	0.357	0.108	0.002	<0.01
A12	0.014	5.89	4.21	2.07	173	0.018	<0.02	0.019	0.022	<0.02	<0.01	0.312	0.134	0.001	<0.01
A13	0.021	6.01	3.22	1.86	47.9	<0.01	<0.02	0.020	<0.02	<0.02	<0.01	0.287	0.111	0.002	<0.01
A14	0.018	5.11	4.27	1.94	62.5	0.022	<0.02	0.022	<0.02	<0.02	<0.01	0.274	0.204	0.002	<0.01
A15	0.012	5.89	3.45	1.87	23.7	0.024	<0.02	0.022	<0.02	<0.02	0.018	0.202	0.227	0.003	<0.01
A16	0.021	19.2	13.7	14.7	116	0.018	<0.02	0.047	0.037	<0.02	0.066	0.317	0.527	0.003	<0.01
A17	0.024	3.44	5.22	1.62	70.8	0.024	<0.02	0.029	<0.02	<0.02	0.02	<0.01	0.097	0.002	<0.01
A18	0.029	6.04	3.28	1.48	32.9	<0.01	<0.02	0.031	0.034	<0.02	<0.01	0.068	0.157	0.003	<0.01
A19	0.034	9.07	5.06	2.77	40.8	0.031	<0.02	0.037	0.078	<0.02	0.012	0.072	0.162	0.003	<0.01
A20	0.101	10.7	8.42	2.48	77.8	0.026	<0.02	0.04	0.044	<0.02	0.073	0.067	0.161	0.003	<0.01
A21	0.157	21.4	7.12	4.27	48.2	0.143	<0.02	0.100	0.147	0.076	0.145	0.046	0.279	0.003	<0.01
A22	0.078	19.8	7.05	7.06	47.3	0.022	<0.02	0.088	0.055	0.055	0.074	0.054	0.209	0.003	<0.01
A23	0.055	17.3	7.03	6.87	49.2	<0.01	<0.02	0.043	0.088	<0.02	0.025	0.067	0.164	0.001	<0.01

Table S3. The total metal and metalloid element content (mg/kg DW) of the soil samples from the sampling stations (1-23), highlighted with different colors (Excel, Conditional Formatting tool) in order to show the highest, medium and lowest concentration variation in each metal column (from highest, red-orange-yellow-green, to lowest values) between the sampling locations.

Sampling station	Fe	Ni	Cr	Cu	Zn	Cd	Pb	Na	Mg	K	Ca	Mn	Al	As	Hg
	mg/kg														
S1	529	23.5	34.1	22.4	134	<0.10	43.5	6.9	967	205	7512	61.1	743	0.134	0.094
S2	11362	42.6	64.4	47.6	130	<0.10	29.4	205	2281	2504	2506	712	2062	0.374	0.075
S3	10831	22.5	38.7	28.4	92.4	<0.10	21.5	124	2243	1912	2482	424	12046	0.108	0.064
S5	11065	82.4	60.7	512	612	<0.10	308	578	2062	2714	9672	1136	19609	0.824	0.657
S7	10246	31.4	23.4	163	148	<0.10	46.3	248	2469	2563	5121	762	17882	0.072	0.14
S8	10364	105	52.4	55.8	336	<0.10	26.4	192	2415	2561	2540	946	17211	0.226	0.061
S9	10003	52.7	16.5	69.4	167	<0.10	37.1	113	2547	1613	7317	834	17513	0.217	0.138
S13	10045	36.2	30.4	81.3	154	<0.10	28.9	112	2082	1194	2316	694	10622	0.146	0.173
S14	10200	59.8	41.5	261	435	<0.10	58.4	248	2364	2367	4022	860	16340	0.233	0.051
S16	10037	31.4	33.4	33.2	123	<0.10	19.5	152	2469	1600	9014	565	12263	0.176	0.098
S17	9245	36.2	28.3	64.7	141	<0.10	27.6	130	2023	1684	8241	537	10354	0.204	0.071
S18	9520	30.8	30.6	113	266	<0.10	33.4	324	2067	1673	11622	912	11267	0.209	0.127
S20	9066	33.6	38.2	166	382	<0.10	159	262	2055	1731	10974	1166	11307	0.326	0.072
S21	9165	38.5	35.5	221	360	<0.10	91.4	309	2016	3164	11842	1228	19797	0.228	0.034
S22	9264	31.2	31.1	114	202	<0.10	40.6	341	2043	1942	10456	821	11752	0.206	0.405
S23	10654	32.5	27.6	82.5	184	<0.10	25.7	116	2052	1167	2341	806	10671	0.211	0.109

Table S4. The total metal and metalloid element content (mg/kg DW) of the sediment samples from the sampling stations (1-23), highlighted with different colors (Excel, Conditional Formatting tool) in order to show the highest, medium and lowest concentration variation in each metal column (from highest, red-orange-yellow-green, to lowest values) between the sampling locations.

Sampling station	Fe	Ni	Cr	Cu	Zn	Cd	Pb	Na	Mg	K	Ca	Mn	Al	As	Hg
	mg/kg														
Sed1	314	8.17	10.4	8.12	22.1	0.41	13.4	57.8	412	117	2013	106	4167	3.11	0.037
Sed2	5712	14.5	20.8	34.1	30.6	0.03	7.14	101	1410	112	1406	211	7032	16.1	0.083
Sed3	5610	13.2	17.3	26.8	76.5	0.03	5.22	82.4	1261	462	2614	214	6127	3.82	0.06
Sed6	5982	41.6	25.5	62.7	154	1.87	92.6	132	1296	1512	4463	342	7168	40.7	0.912
Sed7	5634	7.08	14	33.9	62.8	0.03	6.33	55.8	1174	902	1877	184	5167	8.62	0.211
Sed8	5864	22.3	8.22	41.2	91.8	0.37	12.7	64.2	1067	1367	3942	243	5831	11.2	0.074
Sed9	5431	20.3	18.6	72.4	64.7	0.03	15.8	113	1205	588	4172	362	6229	6.87	0.058
Sed13	5312	16.1	11	67.2	63.1	0.03	9.08	162	1194	640	1367	404	5462	6.57	0.079
Sed14	5604	30.4	23.8	118	112	0.03	29.3	124	1361	1687	2192	386	8022	7.58	0.387
Sed16	5367	18.2	14.9	91.7	74	0.03	5.8	145	1243	1950	1741	295	7268	6.21	0.018
Sed17	5179	16.7	10.5	46.3	48.3	0.03	12.3	126	1262	903	2405	313	7082	6.63	0.018
Sed18	5089	10.8	9.75	65.7	72.4	0.03	10.8	201	1187	386	4613	327	5033	7.06	0.037
Sed20	5304	12.1	16.8	114	141	2	55.1	207	1106	682	5796	417	6547	12.6	0.244
Sed21	5511	21	20.3	127	117	1.47	28.6	198	1913	913	8308	512	7562	11.8	0.127
Sed22	5419	16.5	22.6	15.8	15.6	0.41	10.8	50.7	1306	652	1712	224	5064	11.6	0.108
Sed23	5317	7.1	8.76	7.22	17.6	0.67	9.42	48.3	1264	688	1852	106	3106	11.3	0.113

Table S5. The pollution indices of the surface water sampled from the Arieș River basin.

	Water contamination	
	HPI	**HEI**
A1	29.5	3.45
A2	27.8	3.36
A3	34.3	5.65
A4	29.0	3.44
A5	37.9	9.13
A6	188	383
A7	35.1	14.1
A8	113	35.6
A9	120	11.2
A10	98.5	4.26
A11	118	11.3
A12	115	10.5
A13	94.4	3.86
A14	22.8	3.39
A15	28.0	3.52
A16	47.2	5.63
A17	28.6	3.46
A18	23.4	3.91
A19	26.0	7.16
A20	58.3	6.10
A21	96.7	8.49
A22	88.2	7.78
A23	69.8	6.91

Table S6. Pollution and metal contamination assessing based on the indices values.

C_f values			PLI values			PERI values	
	< 8 Low		**> 1** Pollution exists		**< 150**	Low ecological risk
	8 - 16 Moderate		**< 1** No metal pollution		**150 - 300**	Moderate ecological risk
	16 - 32 Considerable				**300 - 600**	Considerable ecological risk
	< 32 Very high				**< 600**	Very high ecological risk

Table S7. Comprehensive pollution indices of the analyzed metals in soil and sediment samples.

	Soil contamination				Sediment contamination		
	C_f	*PLI*	*PERI*		C_f	*PLI*	*PERI*
S1	5.88	0.320	21.8	**Sed1**	7.12	0.239	123
S2	9.93	0.692	35.3	**Sed2**	15.24	0.569	187
S3	9.57	0.604	32.5	**Sed3**	10.68	0.554	141
S5	42.8	1.58	204	**Sed5**	57.5	1.95	929
S7	11.1	0.714	36.2	**Sed7**	8.91	0.505	83.4
S8	35.9	0.781	166	**Sed8**	14.68	0.741	195
S9	12.2	0.784	42.3	**Sed9**	12.50	0.605	109
S13	12.7	0.791	43.6	**Sed13**	11.9	0.621	96.9
S14	20.2	0.828	79.2	**Sed14**	16.38	0.938	119
S16	10.6	0.676	31.2	**Sed16**	11.0	0.525	85.6
S17	9.05	0.608	25.6	**Sed17**	10.34	0.476	90.7
S18	13.6	0.772	48.4	**Sed18**	11.4	0.514	101
S20	17.7	0.886	70.0	**Sed20**	19.8	0.985	152
S21	23.6	0.990	86.9	**Sed21**	33.7	0.966	565
S22	10.7	0.746	46.8	**Sed22**	13.7	0.488	259
S23	8.75	0.615	33.4	**Sed23**	19.2	0.464	385