

Supplementary Information

Arsenic and antimony lability in recently and historically contaminated soils and its effects on water spinach (*Ipomoea aquatica*)

Supplementary Information 1

Table S1. Nominal and final measured concentrations obtained by total soil acid digestion in historically and recently contaminated bioassay soils (mean \pm SD, $n \geq 3$).

Nominal concentration	Total soil metal concentration		Metalloids accumulated in edible parts mg/kg (dry mass)			
	As	Sb	As	Sb	As	
Historically contaminated soils (mg/kg)						
	Sb	As	Sb	As	Sb	
Control	^a	5.4 \pm 0.6	0.23 \pm 0.02	0.5 \pm 0.2	0.19 \pm 0.05	
HS1	50	42.2 \pm 0.3	40 \pm 8	3.8 \pm 0.7	0.66 \pm 0.05	
HS2	100	71 \pm 4	70 \pm 1	4.4 \pm 0.3	0.4 \pm 0.2	
HS3	150	100 \pm 15	100 \pm 10	6 \pm 1	0.29 \pm 0.03	
HS4	200	160 \pm 50	160 \pm 30	12 \pm 1	0.45 \pm 0.2	
HS5	250	235 \pm 60	150 \pm 50	15 \pm 3	0.54 \pm 0.08	
HS6	300	270 \pm 15	210 \pm 80	42 \pm 7	2 \pm 1	
HS7	400	315 \pm 35	410 \pm 240	36 \pm 10	1.5 \pm 0.4	
HS8	500	520 \pm 50	510 \pm 100	47 \pm 4	1.15 \pm 0.06	
HS9	600	670 \pm 220	670 \pm 230	50 \pm 7	1.32 \pm 0.07	
HS10	800	950 \pm 90	900 \pm 80	73 \pm 7	2.3 \pm 0.3	
HS11	1200	1280 \pm 70	1230 \pm 80	90 \pm 10	1.9 \pm 0.5	
HS12	1600	1410 \pm 90	1750 \pm 170	126 \pm 6	10 \pm 4	
HS13	2000	2630 \pm 150	2920 \pm 240	160 \pm 23	27 \pm 9	
HS14	3500	4200 \pm 200	5090 \pm 500	726	348	
Recently contaminated soils (mg/kg)						
	As	Sb	As	Sb	As	
Control	^a	^a	6 \pm 0.3	0.3 \pm 0.03	0.42 \pm 0.07	0.7 \pm 0.1
RS1	40	40	60 \pm 10	35 \pm 5	16 \pm 2	0.62 \pm 0.09
RS2	80	80	88 \pm 3	56 \pm 10	37 \pm 24	1.0 \pm 0.5
RS3	160	160	175 \pm 2	130 \pm 7	65 \pm 10	1.9 \pm 0.6
RS4	200	300	220 \pm 7	240 \pm 5	80 \pm 7	4.4 \pm 1.5
RS5	300	600	315 \pm 5	250 \pm 10	70 \pm 15	8.9 \pm 0.6
RS6	400	1500	405 \pm 4	1250 \pm 30	40 \pm 7	100 \pm 18

^a Control soils.

Supplementary Information 2- Percentage hydration of water spinach in historically and recently contaminated soils.

Table S2 (A). Percentage hydration of water spinach roots and shoots in historically contaminated soils.

Sample	Root			Shoot		
	Wet mass	Dry mass	% moisture	Wet mass	Dry mass	% moisture
Control	4.33	0.78	82.09	47.19	4.21	91.08
HS1	6.20	0.60	90.26	61.42	4.38	92.86
HS2	5.12	0.73	85.74	34.34	3.34	90.26
HS3	8.13	0.90	88.99	45.10	3.93	91.28
HS4	5.58	0.55	90.18	38.13	3.05	91.99
HS5	8.69	0.62	92.85	37.22	2.97	92.01
HS6	9.73	0.91	90.66	49.43	4.54	90.82
HS7	7.97	0.57	92.84	40.23	2.77	93.12
HS8	7.90	0.69	91.31	41.15	2.94	92.86
HS9	6.17	0.58	90.65	28.38	1.99	93.00
HS10	4.53	0.40	91.15	19.66	1.27	93.53
HS11	6.57	0.56	91.49	19.68	1.45	92.64
HS12	4.07	0.28	93.08	19.31	1.41	92.72
HS13	0.94	0.06	93.68	3.97	0.40	89.86
HS14	0.51	0.02	96.66	1.11	0.08	92.71

Table S2 (B). Percentage hydration of water spinach roots and shoots in recently contaminated soils

Sample	Root			Shoot		
	Wet mass	Dry mass	% moisture	Wet mass	Dry mass	% moisture
Control	4.13	1.46	64.54	45.10	5.84	87.04
RS1	1.49	0.88	40.93	39.17	2.72	93.05
RS2	2.92	0.89	69.52	34.98	2.79	92.08
RS3	3.89	1.07	72.49	30.23	2.75	90.93
RS4	4.15	1.28	69.15	28.34	2.26	92.00
RS5	3.11	1.00	67.84	16.08	1.62	89.93
RS6	0.26	- ^a	- ^a	2.80	0.85	69.64 ^a

^a Measurement error

Supplementary Information 3 The relationship of *I. aquatica* root and shoot dry mass and lengths with (A, C) total and (B, D) bioavailable concentrations in recently contaminated bioassay soils

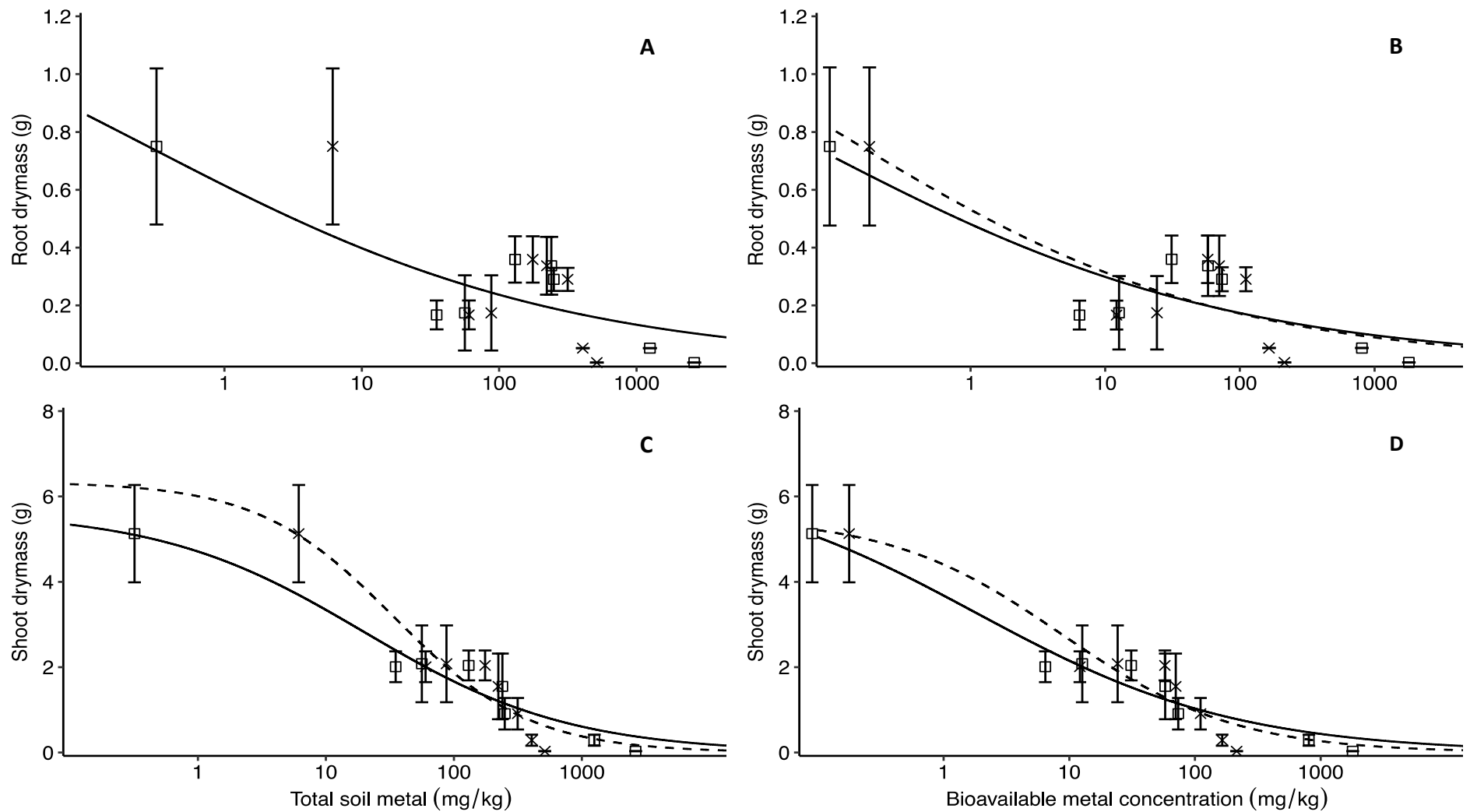


Figure S1. The relationship of *I. aquatica* root and shoot dry mass with (A, C) total and (B, D) bioavailable concentrations in recently contaminated bioassay soils. As (×, dashed line) and Sb (□, solid line). Dry mass reported as mean ± SE, n≥3.

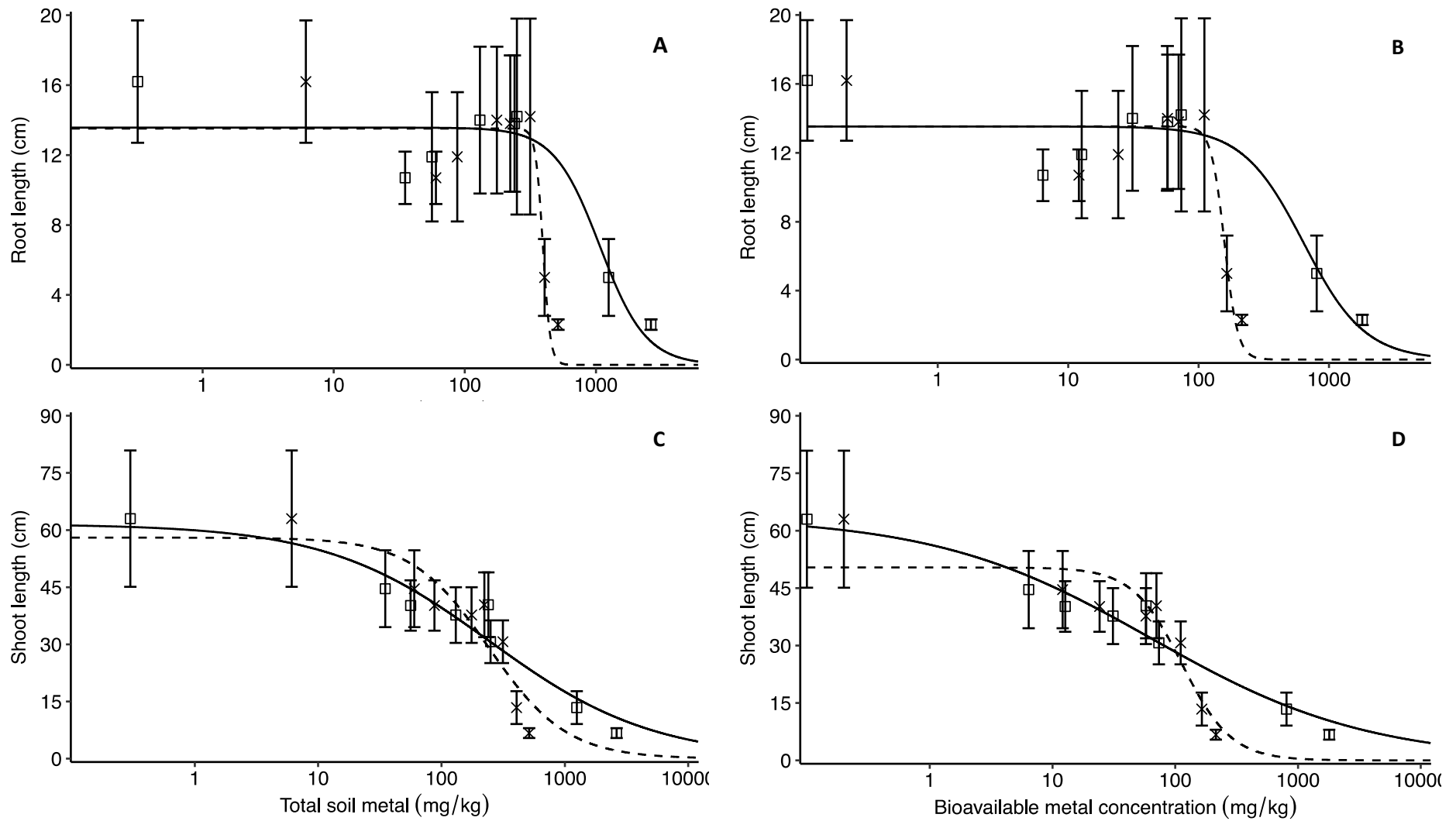
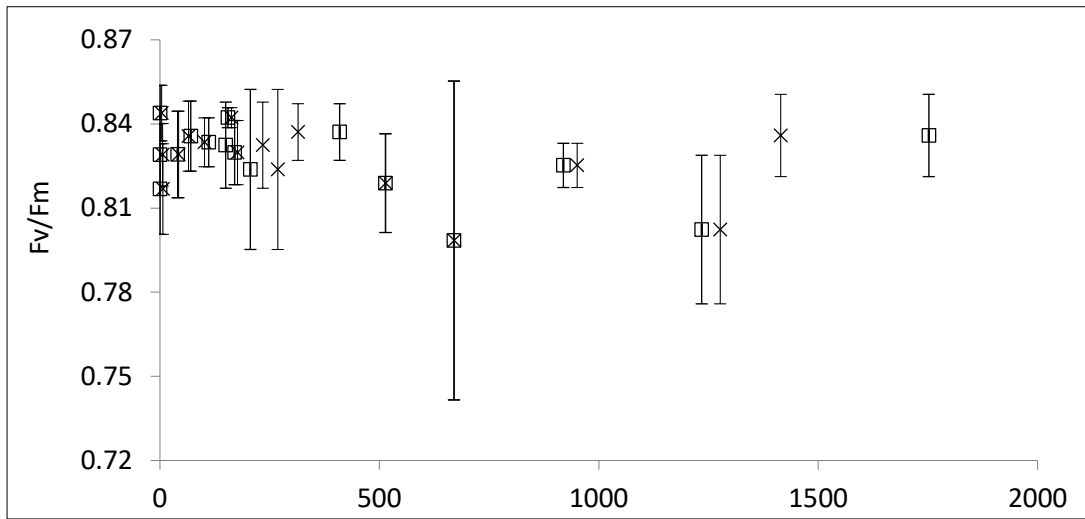


Figure S2. The relationship of *I. aquatica* root and shoot length with (A, C) total and (B, D) SEP-bioavailable concentrations in recently contaminated bioassay soils. As (x, dashed line) and Sb (□, solid line). Tissue length reported as mean \pm SE, $n \geq 3$.

Supplementary Information 4. Photosynthetic efficiency of water spinach (*I. aquatica*) following 30-day exposures to As and Sb in historically and recently contaminated soils

A).



B).

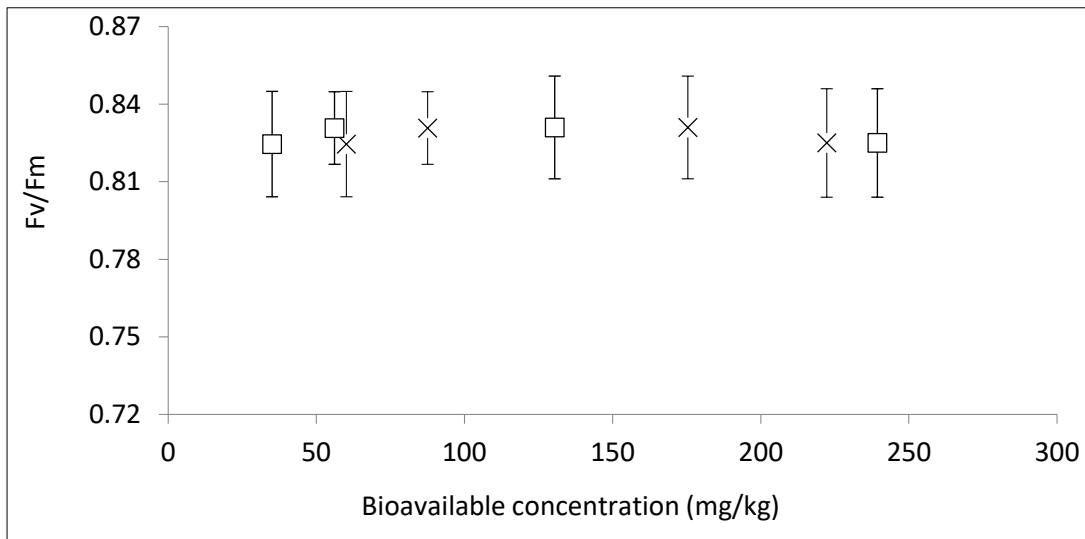


Figure S3 . Photosynthetic efficiency (Fv/Fm) of water spinach (*I. aquatica*), over increasing As (×) and Sb (□) concentrations (mg/kg) **A).** Historically and **B).** Recently contaminated soils