

Supplementary Material of: Sulfur Induces As Tolerance in Barley Plants

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Table S1. Main characteristics of tap water used in the study.

Parameter		Mean ± standard deviation
pH		7.80 ± 0.16
Electrical conductivity (dS m ⁻¹)		0.14 ± 0.05
Anions (mg L ⁻¹)	Cl ⁻	8.0 ± 0.2
	SO ₄ ²⁻	15 ± 2
	NO ₃ ⁻	0.17 ± 0.06
	NO ₂ ⁻	< LQ
	PO ₄ ³⁻	< LQ
Cations (mg L ⁻¹)	Ca ²⁺	17 ± 3
	Mg ²⁺	23 ± 4
	Na ⁺	36 ± 2
	K ⁺	0.5 ± 0.0
Metal(loid)s (mg L ⁻¹)	Al	<LD
	As	<LD
	Cd	<LD
	Cr	<LD
	Cu	<LD
	Fe	<LD
	Mn	<LD
	Ni	<LD
	Pb	<LD
	Sb	<LD
	Zn	<LD

Table S2. Mean values and standard deviation of soil properties in samples collected after plant harvest. Mean values followed by different letters indicate significant differences ($p < 0.05$).

		C	S	SO ₄	As	As-S	As-SO ₄
pH	<i>mean</i>	8.43 a	8.06 c	8.23 b	8.34 ab	8.00 c	8.06 c
	<i>std. dev.</i>	0.14	0.06	0.04	0.08	0.05	0.08
EC (dS m ⁻¹)	<i>mean</i>	0.27 c	1.10 a	0.65 b	0.36 c	1.06 a	1.03 a
	<i>std. dev.</i>	0.06	0.28	0.04	0.08	0.17	0.25
N (%)	<i>mean</i>	0.09 a	0.10 a	0.09 a	0.09 a	0.10 a	0.10 a
	<i>std. dev.</i>	0.00	0.01	0.01	0.01	0.01	0.01
OM (%)	<i>mean</i>	1.54 a	1.49 a	1.42 a	1.56 a	1.59 a	1.54 a
	<i>std. dev.</i>	0.05	0.08	0.04	0.02	0.25	0.05
Ca (mg kg ⁻¹)	<i>mean</i>	3427 ab	3790 a	3306 b	3152 b	3772 a	3718 a
	<i>std. dev.</i>	61	181	180	179	122	205
Mg (mg kg ⁻¹)	<i>mean</i>	390 a	378 a	363 a	372 a	364 a	376 a
	<i>std. dev.</i>	16	24	17	12	25	8
Na (mg kg ⁻¹)	<i>mean</i>	76 a	70 a	65 a	68 a	69 a	101 a
	<i>std. dev.</i>	7	2	6	8	26	8
K (mg kg ⁻¹)	<i>mean</i>	195 b	172 b	178 b	282 a	279 a	318 a
	<i>std. dev.</i>	17	13	11	1	34	25
Cl ⁻ (mg kg ⁻¹)	<i>mean</i>	22.2 b	29.6 b	41.4 b	23.9 b	24.6 b	71.6 ab
	<i>std. dev.</i>	12	13	15	5	4	35
NO ₂ ⁻ (mg kg ⁻¹)	<i>mean</i>	<LQ	<LQ	<LQ	<LQ	<LQ	<LQ
NO ₃ ⁻ (mg kg ⁻¹)	<i>mean</i>	279 bc	381 b	415 b	313 b	139 c	741 a
	<i>std. dev.</i>	82	110	22	17	40	479
PO ₄ ³⁻ (mg kg ⁻¹)	<i>mean</i>	0.82	5.44	<LQ	2.43	5.53	<LQ
	<i>std. dev.</i>	0.12	1.67		1.15	2.99	
SO ₄ ²⁻ (mg kg ⁻¹)	<i>mean</i>	36.1 c	718 b	1453 a	38.8 c	246 b	1192 a
	<i>std. dev.</i>	10.6	70.4	324.3	8.4	15.9	269.3

Table S3. Nutrient mean concentration and standard deviation in root, stem and grain of barley plants grown under the different treatments. Mean values followed by different letters indicate significant differences ($p < 0.05$).

Part of the plant	Nutrient		C	S	SO4	As	As-S	As-SO4
root	K (g kg ⁻¹)	<i>mean</i>	4.84 b	4.86 b	4.39 b	8.16 a	6.10 ab	7.93 a
		<i>std. dev.</i>	0.13	1.69	0.46	1.42	0.64	0.47
	Na (g kg ⁻¹)	<i>mean</i>	0.85 a	1.09 a	0.58 a	1.05 a	0.66 a	1.30 a
		<i>std. dev.</i>	0.16	0.50	0.20	0.23	0.35	0.44
	Ca (g kg ⁻¹)	<i>mean</i>	20.3 a	12.7 b	15.8 ab	5.29 c	3.88 c	3.25 c
		<i>std. dev.</i>	5.42	3.22	2.35	1.61	1.42	0.70
	Mg (g kg ⁻¹)	<i>mean</i>	1.65 ab	1.52 b	2.42 a	1.33 b	0.81 b	1.39 b
		<i>std. dev.</i>	0.38	0.37	0.77	0.22	0.19	0.13
stem	K (g kg ⁻¹)	<i>mean</i>	24.9 c	23.3 c	24.6 c	36.1 b	32.8 b	43.3 a
		<i>std. dev.</i>	2.26	1.50	2.14	2.40	2.03	1.48
	Na (g kg ⁻¹)	<i>mean</i>	2.64 ab	2.64 ab	1.44 b	3.35 a	3.59 a	3.36 a
		<i>std. dev.</i>	0.57	0.30	0.34	1.41	1.10	0.32
	Ca (g kg ⁻¹)	<i>mean</i>	5.77 b	7.18 b	5.94 b	9.09 ab	8.47 ab	11.1 a
		<i>std. dev.</i>	1.67	3.41	0.41	1.24	0.84	0.99
	Mg (g kg ⁻¹)	<i>mean</i>	2.51 a	2.63 a	2.73 a	2.47 a	3.10 a	2.65 a
		<i>std. dev.</i>	0.34	0.44	0.30	0.39	0.76	0.15
grain	K (g kg ⁻¹)	<i>mean</i>	4.73 ab	3.60 b	4.14 ab	4.52 b	3.83 b	5.07 a
		<i>std. dev.</i>	0.50	0.83	0.19	0.30	0.38	0.68
	Na (g kg ⁻¹)	<i>mean</i>	0.044 c	0.046 c	0.045 c	0.230 a	0.069 bc	0.108 b
		<i>std. dev.</i>	0.00	0.01	0.01	0.04	0.01	0.01
	Ca (g kg ⁻¹)	<i>mean</i>	0.057 ab	0.039 c	0.049 bc	0.039 c	0.039 c	0.047 bc
		<i>std. dev.</i>	0.01	0.01	0.01	0.00	0.01	0.01
	Mg (g kg ⁻¹)	<i>mean</i>	0.84 a	0.82 a	0.69 a	0.84 a	0.92 a	0.85 a
		<i>std. dev.</i>	0.02	0.22	0.03	0.03	0.12	0.10
	N (%)	<i>mean</i>	2.25 a	2.47 a	2.18 a	2.67 a	2.63 a	2.58 a
		<i>std. dev.</i>	0.44	0.60	0.11	0.17	0.25	0.03