



Supplementary Material—Dias et al.



Figure S1. (a) Schematic representation of CW microcosm; (b) Picture of real CWs microcosms with *T. latifolia*. The wastewater is changed every 15 days.

Table S1. Initial concentrations and respective standard deviation ($n = 3$) for each metal in livestock wastewater collected, for the first (t0) and second (t0.2) cycles.

	<i>P. australis</i>		<i>T. latifolia</i>	
	t0	t0.2	t0	t0.2
Fe (mg/L)	9 ± 1	13.0 ± 0.1	6 ± 2	2.6 ± 0.1
Zn (mg/L)	4.2 ± 0.1	4.5 ± 0.1	4 ± 1	2.2 ± 0.3
Mn (mg/L)	3.3 ± 0.1	3.8 ± 0.1	2 ± 1	1.1 ± 0.1
Cu (mg/L)	2.0 ± 0.1	2.50 ± 0.03	1.3 ± 0.5	0.7 ± 0.1
Ni (µg/L)	126 ± 23	124 ± 12	83 ± 22	59 ± 5
Cr (µg/L)	75 ± 6	85 ± 2	77 ± 16	56 ± 2
Pb (µg/L)	90 ± 14	63 ± 38	49 ± 21	50 ± 34
Cd (µg/L)	12 ± 3	19 ± 1	13 ± 7	5 ± 1

Table S2. Initial concentrations and respective standard deviation ($n = 3$) for each metal in sand and plant tissues.

	<i>P. australis</i>					<i>T. latifolia</i>		
	Sand	Roots	Rhizomes	Stems	Leaves	Roots	Rhizomes	Leaves
Fe (mg/g)	0.44 ± 0.01	3.1 ± 0.5	1.4 ± 0.5	0.4 ± 0.2	0.4 ± 0.1	3.9 ± 0.1	0.9 ± 0.1	1.9 ± 0.4
Zn (µg/g)	< 4	67 ± 5	26 ± 2	10 ± 3	10 ± 1	303 ± 20	198 ± 14	86 ± 20
Mn (µg/g)	< 4	21 ± 3	8 ± 2	10 ± 1	11 ± 1	147 ± 6	46 ± 3	83 ± 15
Cu (µg/g)	< 4	15.2 ± 0.4	7 ± 1	2.4 ± 0.1	2.7 ± 0.5	80 ± 8	45 ± 4	21 ± 2
Ni (µg/g)	< 0.2	4.8 ± 0.5	3 ± 1	< 1	< 1	7 ± 1	1.7 ± 0.1	1.9 ± 0.2
Cr (µg/g)	0.9 ± 0.3	3.1 ± 0.5	4 ± 1	2.0 ± 0.3		14 ± 3	3 ± 1	7 ± 1
Pb (µg/g)	13 ± 8	16 ± 2	6 ± 2	< 5	< 5	9 ± 3	1.9 ± 0.5	5.2 ± 0.5
Cd (µg/g)	0.7 ± 0.1	0.8 ± 0.5	1.1 ± 0.9	1.4 ± 0.3	1.2 ± 0.2	0.38 ± 0.05	0.16 ± 0.02	0.21 ± 0.03

Table S3. Final concentrations at t15.2 and respective standard deviation ($n = 3$) for each metal in sand and plant tissues for the CWs with expanded clay.

	<i>P. australis</i>					<i>T. latifolia</i>		
	Sand	Roots	Rhizomes	Stems	Leaves	Roots	Rhizomes	Leaves
Fe (mg/g)	0.4 ± 0.1	4 ± 1	0.5 ± 0.2	0.10 ± 0.04	1.6 ± 0.2	3 ± 1	0.5 ± 0.3	0.15 ± 0.05
Zn (µg/g)	4 ± 1	79 ± 12	21 ± 2	41 ± 4	25 ± 4	298 ± 77	104 ± 24	67 ± 6
Mn (µg/g)	4 ± 1	58 ± 8	18 ± 3	19 ± 3	27 ± 3	129 ± 58	24 ± 9	27 ± 3
Cu (µg/g)	< 4	14 ± 1	2.0 ± 0.4	1.8 ± 0.4	6 ± 1	54 ± 14	38 ± 5	7 ± 3
Ni (µg/g)	2 ± 1	3.7 ± 0.5	0.9 ± 0.2	0.4 ± 0.2	0.9 ± 0.2	8 ± 2	1.7 ± 0.4	2 ± 1
Cr (µg/g)	1.4 ± 0.3	1.9 ± 0.4	0.5 ± 0.2	0.9 ± 0.4	5 ± 2	10 ± 3	0.8 ± 0.4	0.7 ± 0.3
Pb (µg/g)	1.0 ± 0.3	4 ± 1	0.9 ± 0.5	0.7 ± 0.5	1.8 ± 0.4	13 ± 4	1.0 ± 0.3	0.5 ± 0.2
Cd (µg/g)	< 0.05	0.08 ± 0.02	0.06 ± 0.03	0.04 ± 0.02	0.03 ± 0.01	2 ± 1	0.12 ± 0.02	0.19 ± 0.05

Table S4. Final concentrations at t15.2 and respective standard deviation ($n = 3$) for each metal in sand and plant tissues for the CWs with lava rock.

	<i>P. australis</i>					<i>T. latifolia</i>		
	Sand	Roots	Rhizomes	Stems	Leaves	Roots	Rhizomes	Leaves
Fe (mg/g)	0.5 ± 0.1	3 ± 1	0.8 ± 0.4	0.12 ± 0.07	1.0 ± 0.4	2 ± 1	0.4 ± 0.3	0.2 ± 0.1
Zn (µg/g)	< 4	61 ± 9	21 ± 5	40 ± 7	31 ± 4	191 ± 65	125 ± 34	69 ± 15
Mn (µg/g)	7 ± 1	58 ± 10	23 ± 6	20 ± 6	28 ± 5	109 ± 52	33 ± 10	39 ± 12
Cu (µg/g)	< 4	9 ± 2	2 ± 1	< 1.4	3 ± 1	43 ± 11	41 ± 18	9 ± 3
Ni (µg/g)		4 ± 1	1.2 ± 0.4	0.3 ± 0.1	1.4 ± 0.6	8 ± 5	1.7 ± 0.6	2.1 ± 0.4
Cr (µg/g)	0.9 ± 0.6	3 ± 1	0.9 ± 0.4	0.9 ± 0.4	3 ± 1	8 ± 4	0.8 ± 0.5	1.0 ± 0.7
Pb (µg/g)	1.7 ± 0.5	4 ± 1	1.1 ± 0.4	0.3 ± 0.2	1.8 ± 0.3	10 ± 2	0.9 ± 0.5	0.4 ± 0.2
Cd (µg/g)	< 0.05	0.12 ± 0.08	0.06 ± 0.04	0.03 ± 0.02	0.06 ± 0.02	0.7 ± 0.2	0.2 ± 0.1	0.15 ± 0.04

Table S5. Initial concentrations and respective standard deviation ($n = 3$) for each nutrient ion in livestock wastewater collected, for the first (t0) and second (t0.2) cycles.

	<i>P. australis</i>		<i>T. latifolia</i>	
	t0	t0.2	t0	t0.2
NH ₄ (mg/L)	675 ± 11	872 ± 56	721 ± 5	564 ± 43
NO ₂ (mg/L)	2.6 ± 0.1	1.08 ± 0.03	5.3 ± 0.4	1.3 ± 0.2
NO ₃ (mg/L)	15 ± 1	29 ± 5	78 ± 16	8 ± 1
PO ₄ ⁻ (mg/L)	171 ± 2	220 ± 6	122 ± 2	110 ± 34

Table S6. Legislated values of metals in irrigation waste and wastewater discharge in Portuguese and international legislation.

	Portuguese Legislation			US EPA
	Irrigation Water		Wastewater Discharge	Irrigation Water
	Recommened	Maximum		
Fe (mg/L)	5.0		2.0	5.0
Zn (mg/L)	2.0	10.0		2.0
Mn (mg/L)	0.2	10	2.0	0.2
Cu (mg/L)	0.2	5.0	1.0	0.2
Ni (mg/L)	0.5	2.0	2.0	0.2
Cr (mg/L)	0.1	20	2.0	0.1
Pb (mg/L)	5.0	20	1.0	5.0
Cd (mg/L)	0.01	0.05	0.2	0.01

