

Supplementary Material

Table S1. Chemical elements abundances in the Earth's Crust and geochemical baseline values near at the sampling sites.

	Pb	Zn	Cu	As	Ag	Cd
Abundances of Chemical Elements in the Earth's Crust [31]	16	83	47	1.7	0.07	0.13
Geochemical baseline values in a natural region (La Zanja) at 30km from the sampling place [22]	44.87	47.42	22.2	27.5	-	4.36

Table S2. Trace elements concentrations (mg kg⁻¹) (mean ± SD) of As, As, Cd, Cu, Pb and Zn in different organs of the native plants from two study areas (S1 and S2) in Hualgayoc district, Cajamarca region, Peru.

N°	Family	Native species	Sites	Biological replicates	Organs	Ag	As	Cd	Cu	Pb	Zn
1		<i>Achyrocline alata</i>	S1	2	L	0.57 ± 0.02	3.82 ± 0.18	3.04 ± 0.35	15.6 ± 1.41	24.4 ± 2.69	266.9 ± 28.0
					S	0.15 ± 0.02	1.34 ± 0.05	3.58 ± 0.11	12.5 ± 0.25	38.2 ± 3.63	298.3 ± 26.3
					R	0.73 ± 0.09	1.75 ± 0.66	2.12 ± 0.50	12.5 ± 1.06	82.7 ± 6.11	76.6 ± 7.69
			S2	1	L	0.06 ± 0.01	0.68 ± 0.03	2.03 ± 0.14	9.52 ± 0.74	8.65 ± 0.73	197.6 ± 8.45
					S	0.03 ± 0.01	0.20 ± 0.01	3.28 ± 0.12	11.4 ± 0.59	28.9 ± 3.67	181.5 ± 8.22
					R	0.08 ± 0.01	0.25 ± 0.01	2.59 ± 0.28	6.81 ± 0.15	64.1 ± 3.48	63.8 ± 2.57
2	Asteraceae	<i>Ageratina fastigiata</i>	S1	3	L	0.50 ± 0.02	1.58 ± 0.12	1.40 ± 0.09	9.01 ± 1.35	13.8 ± 1.53	110.9 ± 27.6
					S	0.34 ± 0.04	1.85 ± 0.11	1.70 ± 0.16	7.12 ± 0.67	30.7 ± 4.09	71.6 ± 7.40
					R	3.09 ± 0.37	5.02 ± 0.72	1.26 ± 0.17	15.1 ± 1.63	139.1 ± 19.7	61.2 ± 5.47
3		<i>Ageratina glechonophylla</i>	S1	1	L	0.75 ± 0.04	6.44 ± 0.44	0.88 ± 0.01	29.5 ± 0.74	52.0 ± 3.93	80.4 ± 1.16
					S	0.12 ± 0.01	1.44 ± 0.14	1.81 ± 0.23	12.0 ± 0.24	25.1 ± 5.92	54.5 ± 1.57
					R	4.82 ± 0.21	9.25 ± 0.91	1.29 ± 0.13	40.3 ± 2.36	203.8 ± 13.3	177.4 ± 5.80
4		<i>Baccharis alnifolia</i>	S1	1	L	0.11 ± 0.01	0.38 ± 0.04	1.70 ± 0.12	7.12 ± 0.30	6.01 ± 0.82	171.6 ± 8.50
					S	0.06 ± 0.01	0.27 ± 0.01	3.45 ± 0.12	6.56 ± 0.60	66.4 ± 8.14	240.4 ± 29.0
					R	2.35 ± 0.17	0.90 ± 0.13	1.31 ± 0.09	12.3 ± 0.86	172.4 ± 22.3	51.3 ± 4.93
5	Bromeliaceae	<i>Puya sp</i>	S1	1	L	0.48 ± 0.01	5.12 ± 0.91	0.22 ± 0.01	13.3 ± 0.82	28.5 ± 5.28	145.0 ± 2.57
					R	1.00 ± 0.08	26.84 ± 2.48	0.13 ± 0.02	22.6 ± 0.41	105.3 ± 11.8	23.38 ± 2.06
6	Calceolariaceae	<i>Calceolaria tetragona</i>	S2	2	L	0.11 ± 0.01	0.52 ± 0.07	1.04 ± 0.13	7.22 ± 0.33	7.36 ± 0.64	53.08 ± 3.29
					S	0.10 ± 0.01	0.32 ± 0.02	6.63 ± 0.31	18.4 ± 0.87	104.0 ± 10.4	235.96 ± 10.2
					R	0.13 ± 0.01	0.72 ± 0.04	3.44 ± 0.06	12.7 ± 0.43	95.6 ± 5.06	220.65 ± 11.0

N°	Family	Native species	Sites	Biological replicates	Organs	Ag	As	Cd	Cu	Pb	Zn
7	Caryophyllaceae	<i>Arenaria digyna</i>	S1	1	L	2.28 ± 0.10	3.93 ± 0.40	3.18 ± 0.20	54.3 ± 1.81	288.3 ± 32.6*	342.34 ± 25.6
					S	10.49 ± 0.10	43.27 ± 6.49	6.30 ± 0.10	82.8 ± 1.65	1178.4 ± 46.5*	458.15 ± 81.3*
					R	10.69 ± 0.79	53.45 ± 3.49	7.71 ± 0.32	71.8 ± 3.31	1657.7 ± 187.2*	413.38 ± 58.6*
8		<i>Bejaria sp.</i>	S1	2	L	0.07 ± 0.01	0.62 ± 0.06	0.06 ± 0.01	4.37 ± 0.34	2.74 ± 0.47	17.63 ± 1.52
					S	0.03 ± 0.01	0.42 ± 0.06	0.35 ± 0.08	3.49 ± 0.55	9.42 ± 1.12	40.41 ± 10.8
					R	0.20 ± 0.05	1.10 ± 0.59	0.16 ± 0.03	3.70 ± 0.69	15.3 ± 6.62	25.02 ± 5.66
9	Ericaceae	<i>Gaultheria glomerata</i>	S2	1	L	0.08 ± 0.01	0.52 ± 0.05	0.45 ± 0.02	7.61 ± 0.39	8.89 ± 1.02	104.0 ± 4.64
					R	0.35 ± 0.02	1.80 ± 0.19	2.75 ± 0.14	19.52 ± 0.47	72.62 ± 6.99	243.5 ± 12.0
10	Ericaceae	<i>Pernettya prostrata</i>	S1	1	L	0.02 ± 0.01	0.68 ± 0.09	0.16 ± 0.01	4.64 ± 0.87	3.21 ± 1.09	28.8 ± 3.99
					S	0.12 ± 0.02	2.56 ± 0.54	0.54 ± 0.04	10.29 ± 1.32	16.9 ± 2.75	85.3 ± 14.79
					R	0.81 ± 0.14	15.19 ± 2.87	0.53 ± 0.06	22.01 ± 1.61	129.8 ± 20.71	52.8 ± 7.43
			S2	2	L	0.03 ± 0.01	0.85 ± 0.02	0.42 ± 0.01	5.14 ± 0.38	3.34 ± 0.45	29.6 ± 0.73
					S	0.04 ± 0.01	0.55 ± 0.03	1.18 ± 0.03	7.50 ± 0.09	11.30 ± 1.46	117.57 ± 3.66
					R	0.36 ± 0.03	2.33 ± 0.14	0.78 ± 0.02	15.19 ± 0.41	55.45 ± 4.23	157.34 ± 6.43
11	Hypericaceae	<i>Hypericum laricifolium</i>	S1	4	L	0.20 ± 0.03	2.01 ± 0.37	1.88 ± 0.04	9.71 ± 0.74	15.84 ± 2.06	101.9 ± 2.68
					S	0.11 ± 0.01	1.15 ± 0.20	1.25 ± 0.22	9.12 ± 0.95	35.42 ± 5.71	84.51 ± 6.76
					R	1.79 ± 0.23	4.40 ± 0.86	1.16 ± 0.17	21.53 ± 3.37	132.8 ± 18.61	133.6 ± 11.97
			S2	1	L	0.12 ± 0.01	0.27 ± 0.01	2.53 ± 0.08	10.71 ± 0.24	3.77 ± 0.27	99.6 ± 8.06
					S	0.09 ± 0.01	0.37 ± 0.03	2.32 ± 0.06	8.21 ± 0.23	40.0 ± 2.29	127.5 ± 9.19
					R	0.23 ± 0.01	1.58 ± 0.17	1.33 ± 0.10	6.07 ± 0.68	159.6 ± 21.5	167.5 ± 11.38
12	Iridaceae	<i>Orthrosanthus chimboracensis</i>	S1	1	L	0.25 ± 0.04	0.78 ± 0.04	0.76 ± 0.04	4.90 ± 0.23	33.3 ± 2.75	100.7 ± 6.56
					R	3.41 ± 0.22	1.21 ± 0.08	0.27 ± 0.03	15.92 ± 0.27	68.6 ± 9.00	30.9 ± 3.49
13	Melastomalaceae	<i>Brachyotum radula</i>	S1	2	L	1.11 ± 0.04	1.71 ± 0.19	0.05 ± 0.01	6.83 ± 0.32	8.73 ± 0.62	32.4 ± 1.71
					S	0.58 ± 0.09	1.44 ± 0.43	0.12 ± 0.02	7.57 ± 0.34	8.97 ± 1.77	28.9 ± 1.58
					R	1.74 ± 0.21	3.87 ± 0.49	0.14 ± 0.01	11.4 ± 1.03	53.5 ± 5.72	19.2 ± 1.56
			S2	2	L	0.17 ± 0.01	0.41 ± 0.03	0.07 ± 0.01	7.96 ± 0.12	2.60 ± 0.28	29.2 ± 1.44
					S	0.17 ± 0.01	0.53 ± 0.04	0.30 ± 0.03	9.60 ± 0.29	9.73 ± 1.04	41.7 ± 2.84
					R	1.18 ± 0.07	0.63 ± 0.11	0.39 ± 0.07	13.12 ± 0.29	16.9 ± 2.21	31.0 ± 1.28
14		<i>Miconia vaccinioides</i> ^a	S2	1	L	0.15 ± 0.01	0.26 ± 0.03	1.52 ± 0.06	10.65 ± 0.32	25.5 ± 1.66	70.4 ± 3.93
					S	0.09 ± 0.01	0.20 ± 0.02	1.58 ± 0.05	6.41 ± 0.23	76.6 ± 4.05	76.6 ± 2.62
15	Poaceae	<i>Calamagrostis recta</i>	S1	2	L	0.67 ± 0.08	3.99 ± 0.40	0.55 ± 0.02	10.9 ± 0.50	100.4 ± 12.0	81.7 ± 5.16
					R	13.3 ± 0.76	42.4 ± 3.67	1.83 ± 0.13	54.7 ± 1.60	826.5 ± 120.6*	309.5 ± 14.2
16		<i>Chusquea scandens</i>	S1	2	L	0.52 ± 0.07	4.76 ± 0.72	0.39 ± 0.01	11.5 ± 0.86	47.9 ± 5.44	152.5 ± 8.90
					S	0.43 ± 0.08	4.30 ± 0.87	0.19 ± 0.03	9.75 ± 2.13	36.1 ± 5.71	62.2 ± 8.81

N°	Family	Native species	Sites	Biological replicates	Organs	Ag	As	Cd	Cu	Pb	Zn
17		<i>Cortaderia bifida</i>	S1	5	R	1.97 ± 0.32	11.05 ± 2.24	0.25 ± 0.03	26.1 ± 2.35	77.6 ± 8.09	40.6 ± 0.98
					L	0.07 ± 0.01	0.49 ± 0.06	0.13 ± 0.10	4.15 ± 0.23	23.1 ± 2.73	25.5 ± 2.08
					S	0.08 ± 0.01	0.66 ± 0.04	0.17 ± 0.01	4.41 ± 0.41	22.3 ± 1.48	39.8 ± 8.27
					R	0.16 ± 0.04	1.35 ± 0.19	0.11 ± 0.01	7.96 ± 0.68	93.9 ± 10.4	99.3 ± 6.41
					L	0.05 ± 0.01	0.24 ± 0.01	0.07 ± 0.01	5.33 ± 0.20	17.0 ± 1.18	33.8 ± 1.17
					S	0.02 ± 0.01	0.17 ± 0.02	0.13 ± 0.01	3.45 ± 0.35	11.62 ± 0.54	23.7 ± 0.38
18		<i>Festuca sp</i>	S2	1	R	0.19 ± 0.01	1.23 ± 0.08	0.30 ± 0.01	7.87 ± 0.29	48.43 ± 3.48	191.3 ± 13.3
					L	0.03 ± 0.01	0.23 ± 0.01	0.31 ± 0.01	3.47 ± 0.07	5.18 ± 0.57	66.1 ± 1.20
19	Polygonaceae	<i>Muehlenbeckia tamnifolia</i> ^a	S2	1	L	0.05 ± 0.01	0.47 ± 0.01	1.05 ± 0.02	68.47 ± 1.86	17.10 ± 1.38	157.5 ± 3.38
					S	0.02 ± 0.01	0.26 ± 0.03	0.34 ± 0.02	21.33 ± 1.41	25.34 ± 3.31	65.6 ± 4.50
20	Scrophulariaceae	<i>Buddleja interrupta</i> ^a	S2	1	L	0.14 ± 0.03	0.24 ± 0.04	2.37 ± 0.24	11.92 ± 0.36	1.42 ± 0.20	142.0 ± 8.49
					S	0.05 ± 0.01	0.15 ± 0.01	4.37 ± 0.13	15.38 ± 0.17	13.7 ± 1.31	241.1 ± 10.8
21	Solanaceae	<i>Nicotiana thyrsoiflora</i>	S1	1	L	2.97 ± 0.22	1.70 ± 0.03	21.62 ± 0.25	48.51 ± 0.57	41.8 ± 2.05	635.4 ± 128.9*
					S	0.37 ± 0.03	0.29 ± 0.03	3.70 ± 0.29	6.30 ± 0.34	45.0 ± 5.29	245.0 ± 30.7*
					R	3.52 ± 0.05	1.52 ± 0.09	1.78 ± 0.09	7.47 ± 0.09	66.1 ± 9.11	71.5 ± 6.66

L: leaf, S: Stem, R: Root. *Outlier, not taken into statistical processing. ^aSpecies collected without roots, not taken for the analysis of the results.

Table S3. Average concentrations of trace elements in organs for the same plant species found in the same sampling area (S1 or S2).

Plant species	Sampling area	Nr of biological replicates	Organs	Ag		As		Cd		Cu		Pb		Zn	
				mg/kg	± SD	mg/kg	± SD	mg/kg	± SD	mg/kg	± SD	mg/kg	± SD	mg/kg	± SD
<i>Ageratina fastigiata</i>	1	3	L	0,50	± 0,36	1,58	± 1,31	1,40	± 0,18	9,0	± 0,9	111,0	± 32,7	13,8	± 5,0
			S	1,85	± 0,34	1,85	± 1,69	1,70	± 0,36	7,1	± 2,1	71,6	± 14,1	30,7	± 24,5
			R	3,09	± 2,69	5,02	± 4,51	1,26	± 0,22	15,1	± 7,1	61,2	± 25,3	139,1	± 78,3
<i>Cortaderia bifida</i>	1	5	L	0,49	± 0,29	0,07	± 0,13	0,13	± 0,17	4,1	± 0,9	25,5	± 0,8	23,1	± 24,3
			R	1,35	± 1,38	0,16	± 0,11	0,11	± 0,04	8,0	± 2,7	99,3	± 6,9	93,9	± 20,2
<i>Achyrocline alata</i>	1	2	L	3,82	± 1,78	0,57	± 0,63	3,04	± 2,49	15,6	± 8,5	267,0	± 193,9	24,4	± 7,9
			S	1,34	± 0,53	0,15	± 0,06	3,58	± 1,86	12,5	± 4,0	298,4	± 47,2	38,2	± 6,7
			R	1,75	± 1,19	0,73	± 0,31	2,12	± 1,62	12,5	± 2,6	76,6	± 26,0	82,7	± 40,8
<i>Hypericum laricifolium</i>	1	4	L	2,01	± 0,47	0,2	± 0,05	1,88	± 2,61	9,7	± 2,0	101,8	± 86,4	15,8	± 5,8
			S	1,15	± 0,80	0,11	± 0,01	1,25	± 1,47	9,1	± 3,8	84,5	± 65,4	35,4	± 10,8
			R	4,40	± 2,61	1,79	± 0,33	1,16	± 1,41	21,5	± 10,5	133,6	± 138,5	132,8	± 11,4
<i>Calamagrostis recta</i>	1	2	L	3,99	± 2,17	0,67	± 0,41	0,55	± 0,48	10,9	± 0,2	81,7	± 19,4	100,4	± 87,8

			R	42,38 ± 45,75	13,3 ± 15,9	1,83 ± 1,89	54,7 ± 43,0	309,5 ± 38,5	826,5 ± 96,8
<i>Brachyotum radula</i>	1	2	L	1,71 ± 0,11	1,11 ± 1,09	0,05 ± 0,00	6,8 ± 0,8	32,4 ± 20,9	8,7 ± 1,7
			S	1,44 ± 1,27	0,58 ± 0,59	0,12 ± 0,01	7,6 ± 1,7	28,9 ± 13,5	9,0 ± 1,0
			R	3,87 ± 3,77	1,74 ± 0,56	0,14 ± 0,01	11,4 ± 6,8	19,2 ± 8,7	53,6 ± 51,2
<i>Chusquea scandens</i>	1	2	L	4,76 ± 5,55	0,52 ± 0,64	0,39 ± 0,48	11,5 ± 8,6	152,6 ± 163,3	47,9 ± 44,4
			S	4,30 ± 5,35	0,43 ± 0,53	0,19 ± 0,18	9,7 ± 6,4	62,3 ± 42,0	36,1 ± 33,3
<i>Bejaria sp.</i>	2	2	L	0,62 ± 0,25	0,07 ± 0,06	0,06 ± 0,08	4,4 ± 1,4	17,6 ± 1,3	2,7 ± 0,3
			S	0,42 ± 0,19	0,03 ± 0,03	0,35 ± 0,23	3,5 ± 1,5	40,4 ± 10,7	9,4 ± 8,8
<i>Cortaderia bifida</i>	2	5	L	2,45 ± 1,82	0,50 ± 0,43	0,46 ± 0,49	8,6 ± 3,0	73,8 ± 53,0	39,04 ± 39,0
			R	11,07 ± 1,44	3,47 ± 0,64	0,73 ± 0,23	20,2 ± 2,9	113,0 ± 30,6	211,68 ± 39,4
<i>Pernettya prostrata</i>	2	2	L	0,85 ± 0,82	0,03 ± 0,003	0,42 ± 0,03	5,1 ± 2,3	29,6 ± 2,7	3,34 ± 1,25
			S	0,55 ± 0,29	0,04 ± 0,001	1,18 ± 0,08	7,5 ± 2,2	117,6 ± 32,0	11,2 ± 2,73
			R	2,33 ± 1,21	0,36 ± 0,03	0,78 ± 0,27	15,2 ± 3,1	157,3 ± 40,1	55,4 ± 14,5
<i>Calceolaria tetragona</i>	2	2	L	0,52 ± 0,47	0,11 ± 0,1	1,04 ± 0,35	7,2 ± 1,8	53,1 ± 12,4	7,36 ± 8,2
			S	0,32 ± 0,25	0,10 ± 0,001	6,63 ± 2,14	18,4 ± 2,5	236,0 ± 30,8	104,0 ± 64,6
			R	0,72 ± 0,09	0,13 ± 0,03	3,44 ± 1,88	12,7 ± 3,0	220,6 ± 124,7	95,6 ± 58,2
<i>Brachyotum radula</i>	2	2	L	0,54 ± 0,02	0,08 ± 0,05	1,11 ± 0,10	7,4 ± 0,2	85,3 ± 45,6	9,33 ± 2,8
			S	1,32 ± 1,42	0,23 ± 0,18	3,71 ± 4,14	16,8 ± 2,3	196,7 ± 55,6	79,7 ± 34,3
			R	0,72 ± 0,14	0,13 ± 0,02	3,44 ± 1,70	12,7 ± 3,8	220,6 ± 118,5	95,6 ± 62,4

L: leaf, S: Stem, R: Root.