

Supplementary Information

Heavy metal profiles in limpets and algae on the Eastern Cape coast of South Africa

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Supplementary Table S1: Mean and standard deviation of metal concentrations (mg kg⁻¹ DW) in algae tissues per species and per site on the Eastern Cape coast

Metal	<i>Ralfsia verrucosa</i>	<i>Ulva</i> sp.	<i>Gelidium pristoides</i>	Mbhashe	Mthatha	Hluleka	Silaka
Zn	11.21 ± 4.86	11.93 ± 6.23	0.18 ± 0.14	6.98 ± 5.81	12.93 ± 9.09	6.00 ± 4.38	5.19 ± 5.12
As	25.89 ± 3.32	4.85 ± 2.35	2.13 ± 0.68	9.60 ± 10.00	12.21 ± 11.74	10.37 ± 8.30	11.64 ± 12.75
Cd	1.53 ± 0.27	1.43 ± 0.50	0.52 ± 0.27	1.19 ± 0.61	1.24 ± 0.67	1.46 ± 0.42	0.76 ± 0.30
Cu	5.53 ± 2.70	5.82 ± 2.52	1.03 ± 0.54	3.39 ± 2.17	5.41 ± 3.89	3.39 ± 1.67	4.31 ± 3.52
Fe	833.00 ± 532.70	707.33 ± 177.25	173.33 ± 77.28	426.22 ± 242.78	588.78 ± 353.12	854.33 ± 661.33	411.56 ± 79.52
Pb	1.40 ± 1.06	0.46 ± 0.62	0.19 ± 0.09	1.21 ± 0.68	0.32 ± 0.10	0.10 ± 0.00	1.10 ± 1.28
Hg	2.68 ± 1.98	4.44 ± 6.26	34.28 ± 36.00	6.71 ± 1.15	13.54 ± 6.38	2.74 ± 2.87	32.20 ± 45.16
Ni	10.94 ± 11.07	4.98 ± 1.80	0.33 ± 0.39	3.09 ± 3.08	11.54 ± 12.54	1.96 ± 4.62	4.62 ± 4.24

Supplementary Table S2: Mean and standard deviation of metal concentrations (mg kg⁻¹ DW) in limpet tissues for each site on the Eastern Cape coast

Metal	Limpet shell tissue				Limpet soft tissues			
	Mbhashe	Mthatha	Hluleka	Silaka	Mbhashe	Mthatha	Hluleka	Silaka
Zn	1.45 ± 0.79	3.02 ± 3.54	0.15 ± 0.09	8.30 ± 2.48	34.54 ± 10.67	25.49 ± 4.34	29.31 ± 4.60	34.65 ± 4.79
As	0.17 ± 0.10	1.17 ± 0.99	31.11 ± 52.80	0.10 ± 0.00	4.63 ± 5.00	9.67 ± 4.32	13.20 ± 9.49	8.19 ± 7.62
Cd	1.73 ± 0.30	0.12 ± 0.03	0.13 ± 0.04	0.32 ± 0.24	41.81 ± 20.21	23.61 ± 4.39	51.37 ± 19.21	25.10 ± 3.46
Cu	2.98 ± 1.83	1.60 ± 0.88	0.18 ± 0.13	0.10 ± 0.00	1.03 ± 1.14	1.33 ± 0.34	1.34 ± 1.00	2.60 ± 1.33
Fe	489.33 ± 463.80	120.13 ± 97.63	97.22 ± 34.68	37.78 ± 11.69	583.54 ± 123.58	416.82 ± 75.74	564.88 ± 91.55	676.75 ± 90.83
Pb	0.23 ± 0.09	0.28 ± 0.25	0.10 ± 0.00	0.10 ± 0.00	0.10 ± 0.00	0.10 ± 0.00	0.51 ± 0.54	0.69 ± 0.51
Hg	0.10 ± 0.00	4.40 ± 4.33	3.18 ± 1.48	0.10 ± 0.00	1.35 ± 1.38	1.64 ± 2.24	1.88 ± 1.66	0.46 ± 0.60
Ni	69.38 ± 60.65	5.74 ± 7.76	1.44 ± 2.06	0.19 ± 0.10	18.72 ± 6.95	9.92 ± 4.26	5.10 ± 1.59	45.98 ± 62.00

Supplementary Table S3: Mean and standard deviation of metal concentrations (mg kg⁻¹ DW) in limpet tissues for each species

Metal	<i>Scutellastra cochlear</i>	<i>S. longicosta</i>	<i>S. granularis</i>	<i>Cellana capensis</i>	<i>S. cochlear</i>	<i>S. longicosta</i>	<i>S. granularis</i>	<i>C. capensis</i>
Zn	3.06 ± 7.43	4.23 ± 5.70	3.52 ± 4.39	2.11 ± 3.09	31.91 ± 4.50	36.23 ± 7.89	37.78 ± 7.67	22.54 ± 3.65
As	0.85 ± 1.18	0.20 ± 0.20	0.72 ± 1.31	30.78 ± 101.38	0.10 ± 0.00	7.56 ± 3.74	3.60 ± 2.70	19.37 ± 5.18
Cd	0.43 ± 0.93	0.64 ± 1.33	0.58 ± 1.28	0.63 ± 1.71	30.68 ± 8.64	51.87 ± 27.22	31.57 ± 9.10	23.23 ± 7.45
Cu	0.88 ± 1.84	0.98 ± 1.72	1.93 ± 2.88	1.06 ± 2.83	0.91 ± 0.62	1.63 ± 3.63	1.37 ± 0.98	2.49 ± 0.79
Fe	121.67 ± 106.10	122.99 ± 181.17	359.50 ± 544.35	140.29 ± 194.13	645.58 ± 120.60	490.58 ± 200.43	747.75 ± 168.48	515.42 ± 123.47
Pb	0.10 ± 0.00	0.30 ± 0.51	0.16 ± 0.19	0.15 ± 0.11	0.36 ± 0.52	0.15 ± 0.10	0.22 ± 0.19	0.77 ± 0.90
Hg	1.02 ± 1.95	1.13 ± 1.23	2.07 ± 2.55	3.58 ± 6.04	0.55 ± 1.18	1.03 ± 2.74	0.63 ± 1.18	2.56 ± 5.53
Ni	10.28 ± 13.04	8.62 ± 23.51	43.66 ± 77.17	14.20 ± 21.03	18.03 ± 21.19	48.42 ± 113.76	9.42 ± 5.48	9.24 ± 4.89

Supplementary Table S4: Maximum limits (ML) for purposes of human consumption recommended by the South African Department of Health (RSA 2004) for heavy metal concentrations (mg kg⁻¹ DW) in shellfish or fish products

Metal	ML	Species
Cd	3.0	Shellfish and shellfish products
As	3.0	Fish and processed fish
Pb	0.5	Fish and processed fish
Hg	0.5	Shellfish and shellfish products
Ni	–	
Zn	–	
Cu	–	
Fe	–	