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Supplementary information

In vitro human bioavailability of major, trace and ultra-trace elements in Chilean 'natural' wines from Itata Valley

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Supporting information regards ICP-MS operating conditions (Table S1) and limit of detection/quantification for total and bioavailable elements determination (Table S2).

These tables are as follows:

Table S1. Operating ICP–MS conditions

ICP-MS		
General	Radiofrequency power / W	1600
	Peristaltic pump speed / r.p.m.	2.5
Gas flows / L min^{-1}	Plasma	18.0
	Auxiliary	1.2
	Nebulizer	0.89
O_2 flow rate / L min^{-1}		0.01
KED mode: He flow rate / mL min^{-1}		1.0
Mass-to-charge ratio	^{107}Ag, ^{27}Al, ^{75}As, ^{11}B, ^{135}Ba, ^{9}Be, $^{4}3Ca$, ^{114}Cd, ^{59}Co, ^{52}Cr, ^{65}Cu, ^{57}Fe, ^{202}Hg, ^{69}K, ^{7}Li, ^{24}Mg, ^{55}Mn, ^{98}Mo, ^{60}Ni, ^{208}Pb, ^{195}Pt, ^{121}Sb, ^{82}Se, ^{118}Sn, ^{88}Sr, Ti, ^{205}Tl, ^{51}V	
	Internal standards: ^{72}Ge, ^{115}In, ^{54}Sc and ^{89}Y (10, 10, 25, and 25 μg L^{-1})	

Table S2. LOD and LOQ (μg L^{-1}, referred to wine sample) in wine samples (total concentrations and bioavailable concentrations)

	Total contents		Bioavailable contents			Total contents		Bioavailable contents	
	LOD	LOQ	LOD	LOQ		LOD	LOQ	LOD	LOQ
Ag	0.11	0.35	0.28	0.95	Li	0.031	0.090	0.043	0.14
Al	2.5	8.4	2.9	9.6	Mg	0.0040[a]	0.012[a]	0.057	0.19
As	0.10	0.32	1.5	5.2	Mn	0.12	0.41	1.8	5.9
B	0.017[a]	0.057[a]	0.050[a]	0.17[a]	Mo	0.058	0.19	4.3	14.5
Ba	0.39	1.3	3.6	12	Ni	0.24	0.79	8.6	29
Be	0.019	0.064	0.045	0.15	Pb	0.11	0.38	0.23	0.79
Ca	0.013[a]	0.043[a]	0.045[a]	0.15[a]	Pt	0.011	0.036	0.080	0.27
Cd	0.051	0.17	0.14	0.48	Sb	0.22	0.75	0.15	0.49
Co	0.019	0.065	0.16	0.55	Se	1.0	3.5	3.6	12
Cr	0.66	2.2	5.0	17	Sn	0.17	0.56	0.26	0.87
Cu	0.81	2.7	3.6	12	Sr	0.056	0.19	1.8	6.0
Fe	4.5	15	6.3	21	Ti	0.14	0.46	12	41
Hg	0.16	0.54	1.2	4.0	Tl	0.0041	0.013	0.029	0.10
K	0.035[a]	0.12[a]	0.21	0.70	V	0.024	0.079	0.18	0.59

(a) mg L^{-1}

Supporting information regards environmental setting in Itata Valley area

According to the vitivinicultural sector legal decree N°464 (Dic 1994), five geographical areas (Atacama, Coquimbo, Aconcagua, Central Valley and South Region) and fifteen sub-areas are established. The Itata Valley is a subzone inside the South Region with 14311 ha in continental surface [1].

The geomorphological and geological environment

Depending on latitude four geographic macro forms are distinctive and important to understand the geo climatic Chile variations. From the East to the Western part of the country, the macro-forms are the Andes mountain range; the intermediate depression; the mountains of the coast; and the coastal plains [2].

Soils in Itata Valley are generated from three different parental materials, such as:

1. Eroded metamorphic rocks: Presence of slate, sandstone, phyllite and blackboards texture of clayey soil and slow infiltration of water. This type of soil is found in areas with steep hills and

variable and complex slopes, exhibiting the Catena formation due to topography and drainage characteristics. [2]

2. Granitic origin: Derived from granite rock and diorite, which textures clayey and low water infiltration that make the soil susceptible to water erosion.

3. Fine alluvial sediment: derived from fine alluvial sediments is the result of the deposition of large amounts of fluvioglacial sediments from the glaciation of the mountain Andes, a phenomenon that occurred during the Quaternary era. The thickness of the deposit varies considerably due to the influences of the rivers present in the area that transport large amounts of sediments (especially fine loamy clayey clay materials) [2].

References:

[1] R. Ley, N. Que, F. Normas, E.Y.C. De, Decreto n° 78, (n.d.).

[2] Stolpe, 2006, Trama Impr. Chillan, Chile, 2006.