

# Joint Research Centre

## Certified reference materials for trace elements in plants



### Aquatic plants

(Values in brackets are not certified)

[mg/kg]	BCR-596 Trapa natans, 25 g	BCR-414 Plankton, 5 g	BCR-670 Lemna minor (duck weed), 10 g	ERM-CD200 Bladderwrack (seaweed) 5g
Al		6.82 ± 0.28	(1.98 ± 0.19)	55 ± 4
As		0.383 ± 0.014	(0.0755 ± 0.0025)	0.95 ± 0.06
Cd		(1.43 ± 0.06)		
Co		23.8 ± 1.2	(2.05 ± 0.10)	
Cr	36.3 ± 1.7	29.5 ± 1.3	(1.82 ± 0.30)	1.71 ± 0.18
Cu		(1850 ± 190)		
Fe		0.276 ± 0.018		0.0186 ± 0.0016
Hg		(7.55 ± 0.17)		
K		299 ± 13		
Mn		(1.35 ± 0.20)	(0.56 ± 0.07)	
Mo		18.8 ± 0.8		
Ni		3.97 ± 0.19	(2.06 ± 0.12)	0.51 ± 0.06
Pb		(0.54 ± 0.02)	0.191 ± 0.011	
Sc		1.75 ± 0.10		0.088 ± 0.010
Se		(261 ± 25)		
Sr		8.10 ± 0.18		
V		111.6 ± 2.5	(24.0 ± 2.1)	25.3 ± 1.7
Zn			Also values for rare earth elements are assigned	

### Confidence in measurements

All certificates and detailed production information can be found at <https://crm.jrc.ec.europa.eu>

## Land plants

	BCR-100 Beech leaves, 30 g	BCR-129 Hay powder, 30 g	BCR-402 White clover, 25 g	ERM-CD281 Rye grass, 10 g	BCR-482 Lichen, 15 g
Al [mg/kg]	435 ± 4				1103 ± 24
As [mg/kg]			0.093 ± 0.010	0.042 ± 0.010	0.85 ± 0.07
B [mg/kg]				5.5 ± 0.5	
Ca [g/kg]	5.30 ± 0.05	6.40 ± 0.10			0.56 ± 0.02
Cd [mg/kg]				0.120 ± 0.007	
Co [mg/kg]			0.178 ± 0.008		
Cl [g/kg]	1.49 ± 0.06				
Cr [mg/kg]	8.0 ± 0.6			24.8 ± 1.3	4.12 ± 0.15
Cu [mg/kg]				10.2 ± 0.5	7.03 ± 0.19
Hg [mg/kg]				0.0164 ± 0.0022	0.48 ± 0.02
I [mg/kg]		0.167 ± 0.024			
K [g/kg]	9.94 ± 0.20	33.8 ± 0.8			
Mg [g/kg]	0.878 ± 0.017	1.45 ± 0.04			
Mn [mg/kg]				82 ± 4	
Mo [mg/kg]			6.93 ± 0.19	2.22 ± 0.12	
N [g/kg]	26.29 ± 0.25	37.2 ± 0.5			
Kjeldahl-N [g/kg]		34.2 ± 0.4			
Ni [mg/kg]				15.2 ± 0.6	2.47 ± 0.07
P [g/kg]	1.55 ± 0.04	2.36 ± 0.07			
Pb [mg/kg]				1.67 ± 0.11	40.9 ± 1.4
S [g/kg]	2.69 ± 0.04	3.16 ± 0.04			
Sb [mg/kg]				0.042 ± 0.007	
Se [mg/kg]			6.70 ± 0.25	0.023 ± 0.004	
Sn [mg/kg]				0.062 ± 0.011	
Zn [mg/kg]		32.1 ± 1.7		30.5 ± 1.1	100.6 ± 2.2

## Food plants


Code	Certified values
BCR-679 White cabbage 15 g	B [mg/kg] (27.7 ± 1.9)
	Ba [mg/kg] (10.3 ± 0.6)
	Ca [mg/kg] (7768 ± 655)
	Cd [mg/kg] 1.66 ± 0.07
	Cr [mg/kg] (0.6 ± 0.1)
	Cu [mg/kg] 2.89 ± 0.12
	Fe [mg/kg] 55.0 ± 2.5
	Hg [µg/kg] 6.3 ± 1.4
	Mg [mg/kg] (1362 ± 127)
	Mn [mg/kg] 13.3 ± 0.5
	Mo [mg/kg] 14.8 ± 0.5
	Ni [mg/kg] 27.0 ± 0.8
	P [mg/kg] (3307 ± 241)
	Sb [µg/kg] 20.6 ± 2.6
	Sr [mg/kg] 11.8 ± 0.4
Tl [µg/kg] 3.0 ± 0.3	
Zn [mg/kg] 79.7 ± 2.7	
IRMM-804 Rice flour 15 g	As [mg/kg] 0.049 ± 0.004
	Cd [mg/kg] 1.61 ± 0.07
	Cu [mg/kg] 2.74 ± 0.24
	Mn [mg/kg] 34.2 ± 2.3
	Pb [mg/kg] 0.42 ± 0.07
Zn [mg/kg] 23.1 ± 1.9	
BCR-383 Haricots verts 100 g	Ca [g/kg] 2.85 ± 0.23
	K [g/kg] 7.8 ± 0.4
	Mg [g/kg] (0.9)
	Na [g/kg] 0.075 ± 0.007
	P [g/kg] (1.8)

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