



**WAGENINGEN EVALUATING PROGRAMS
FOR ANALYTICAL LABORATORIES**

Certificate of Analysis



International Plant-Analytical Exchange

REFERENCE MATERIAL

IPE sample 233



General Information

In this report an overview is given of analytical data for this sample collected in our proficiency testing program. The consensus values are calculated using a robust statistical model. With this NDA model, the mean and standard deviation are calculated using all reported data when at least 4 results are left after removal of reported 'lower than' (<) and 0 (= zero) values. No outliers are removed.

This report is divided into two sections: Consensus Values and Indicative Values. The division is made on the reliability of the data. Consensus Values are based on at least 8 results and a maximum relative uncertainty of 6.25%. Indicative Values are based on a maximum relative uncertainty of 35% and a minimum of 4 and maximum of 7 results, or a relative uncertainty greater than 6.25% when there are at least 8 results.

For each determinand the following parameters are given: mean, standard deviation, coefficient of variation, number of results, median, MAD (Median of Absolute Deviation), the uncertainty of the mean (consensus or indicative) value and the relative uncertainty.

All values, expressed on a weight basis (kg or %), are reported as oven-dried (105°C) material. Moisture is reported in the material as received.

Sample information

WEPAL reference materials are from natural sources only. There is no spiking, mixing or other alterations of the samples. For sample preparation, the IPE samples are dried at 70°C and milled to pass a 0.5 mm sieve.

This IPE sample 233 of Eucalyptus leaves/Eucalyptus globulus, from Portugal, is prepared for the WEPAL proficiency programs. The sample has been used in 1 period (or round). The results on which the values in this report are based were taken from the period given in the following table:

Year	Round	Number
2016	4	2



Consensus Values IPE 233

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B	mg/kg	66.8	7.24	10.8	72	66.9	5.10	1.07	1.60
Cu	mg/kg	4.84	0.746	15.4	103	4.80	0.465	0.092	1.90
Fe	mg/kg	73.6	8.83	12.0	100	73.6	5.62	1.10	1.50
Mn	mg/kg	792	87.0	11.0	103	795	55.0	10.7	1.35
Zn	mg/kg	12.7	1.61	12.7	102	12.7	0.900	0.199	1.57
Co	µg/kg	109	21.5	19.8	25	109	12.9	5.38	4.94
Hg	µg/kg	57.1	3.57	6.2	10	57.5	2.37	1.41	2.47
Ni	µg/kg	3854	464	12.0	24	3917	238	118	3.07
Ba	mg/kg	17.0	1.65	9.7	12	16.8	0.865	0.595	3.49
Sr	mg/kg	17.1	0.763	4.5	9	17.1	0.523	0.318	1.86
Ca	g/kg	6.06	0.474	7.8	106	6.07	0.258	0.058	0.949
Cl (as Cl)	g/kg	2.44	0.331	13.5	18	2.43	0.182	0.097	3.99
K	g/kg	5.04	0.417	8.3	111	5.10	0.250	0.049	0.982
Mg	g/kg	2.14	0.165	7.7	108	2.13	0.107	0.020	0.929
N - Kjeldahl (as N)	g/kg	14.3	0.811	5.7	65	14.3	0.460	0.126	0.878
Na	mg/kg	2174	197	9.1	60	2166	125	31.8	1.46
P (as P)	g/kg	0.836	0.054	6.4	109	0.837	0.037	0.006	0.772
S (as S)	g/kg	1.08	0.115	10.7	59	1.09	0.080	0.019	1.74

Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
C - elementary	g/kg	560	19.2	3.4	35	555	13.4	4.05	0.723
Al	mg/kg	148	13.2	9.0	14	148	6.63	4.42	3.00
N - elementary	g/kg	15.0	0.759	5.1	54	15.0	0.494	0.129	0.862

Method: Acid extractable (So-called totals)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	mg/kg	111	9.83	8.9	20	110	6.07	2.75	2.48

Method: Nutritional values

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Total ash	g/kg	34.8	1.62	4.6	14	35.0	0.975	0.540	1.55



Indicative Values IPE 233

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
As	µg/kg	63.9	18.9	29.6	12	67.6	8.09	6.82	10.7
Cd	µg/kg	7.91	7.71	97.5	15	8.14	4.64	2.49	31.5
Cr	µg/kg	333	117	35.2	21	368	87.2	32.0	9.59
Li	µg/kg	730	341	46.7	7	825	201	161	22.1
Mo	µg/kg	33.2	14.6	43.9	18	34.7	8.59	4.30	12.9
Pb	µg/kg	135	36.2	26.8	24	139	23.7	9.23	6.84
Se	µg/kg	19.4	10.2	52.8	10	21.9	5.05	4.04	20.9
Sb	µg/kg	7.55	3.62	47.9	4	7.30	1.74	2.26	29.9
Ti	mg/kg	1.69	0.924	54.7	7	1.67	0.495	0.437	25.9
V	µg/kg	108	34.9	32.3	10	108	13.7	13.8	12.8
Be	µg/kg	51.4	8.45	16.4	7	52.4	5.00	3.99	7.77
Rb	µg/kg	16188	1106	6.8	5	16559	659	619	3.82

Method: Other determinations

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
delta 13C	‰ V-PDB	-27.8	0.359	1.3	6	-27.8	0.255	0.183	0.660

Method: Nutritional values

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Crude fibre	g/kg	183	59.2	32.3	6	191	36.1	30.2	16.5
ADF-ash-free	g/kg	362	51.8	14.3	6	347	26.3	26.4	7.31
NDF-ash-free	g/kg	370	51.5	13.9	4	369	30.0	32.2	8.69
Total fat	g/kg	129	34.8	27.0	5	126	13.9	19.5	15.1