



**WAGENINGEN EVALUATING PROGRAMS
FOR ANALYTICAL LABORATORIES**

Certificate of Analysis



International Plant-Analytical Exchange

REFERENCE MATERIAL

IPE sample 173



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 173 of Virginia Creeper / Parthenocissus quinquefolia, from Netherlands, is prepared for the WEPAL proficiency programs. The sample has been used in 3 periods (or rounds). The results on which the values in this report are based were taken from the periods given in the following table:

Year	Round	Number
2019	4	2
2014	4	3
2010	4	4



Consensus Values IPE 173

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B	mg/kg	25.1	2.22	8.8	212	25.0	1.40	0.191	0.760
Cu	mg/kg	8.31	0.831	10.0	292	8.38	0.525	0.061	0.731
Fe	mg/kg	104	11.0	10.6	284	105	7.07	0.818	0.784
Mn	mg/kg	57.8	4.44	7.7	297	57.7	2.70	0.322	0.557
Zn	mg/kg	24.2	2.30	9.5	294	24.3	1.50	0.168	0.692
Cd	µg/kg	18.2	4.29	23.5	46	18.9	2.20	0.790	4.33
Co	µg/kg	48.4	15.7	32.5	53	48.9	9.01	2.70	5.59
Cr	µg/kg	496	128	25.9	50	526	85.7	22.7	4.57
Hg	µg/kg	10.3	1.30	12.6	30	10.4	0.800	0.297	2.88
I	µg/kg	308	33.9	11.0	8	315	22.8	15.0	4.86
Mo	µg/kg	255	42.8	16.8	66	260	25.6	6.59	2.59
Ni	µg/kg	525	112	21.4	48	540	69.2	20.3	3.86
Pb	µg/kg	2099	273	13.0	74	2070	171	39.7	1.89
Se	µg/kg	265	66.7	25.2	36	262	40.0	13.9	5.24
Ba	mg/kg	8.34	0.812	9.7	30	8.37	0.436	0.185	2.22
Sb	µg/kg	59.1	10.4	17.6	19	60.9	7.47	2.98	5.04
V	µg/kg	227	28.2	12.4	23	230	20.0	7.36	3.24
Sr	mg/kg	36.8	2.52	6.8	32	36.6	1.50	0.556	1.51
Rb	µg/kg	16887	1355	8.0	16	16621	639	423	2.51
Ca	g/kg	14.2	0.964	6.8	314	14.2	0.600	0.068	0.479
Cl (as Cl)	g/kg	0.515	0.133	25.7	51	0.550	0.080	0.023	4.51
K	g/kg	14.2	0.868	6.1	317	14.2	0.600	0.061	0.429
Mg	g/kg	1.16	0.084	7.2	317	1.16	0.058	0.006	0.505
N - Kjeldahl (as N)	g/kg	15.7	0.841	5.4	203	15.6	0.500	0.074	0.472
N - NO3 (as N)	mg/kg	126	25.4	20.2	19	131	13.1	7.29	5.78
Na	mg/kg	126	27.7	22.0	178	124	16.2	2.59	2.06
P (as P)	g/kg	2.71	0.168	6.2	313	2.71	0.100	0.012	0.439
S (as S)	g/kg	1.22	0.122	10.1	179	1.22	0.080	0.011	0.940

Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
C - elementary	g/kg	464	12.4	2.7	93	464	7.50	1.61	0.347
N - elementary	g/kg	16.5	0.706	4.3	144	16.5	0.470	0.074	0.446



Consensus Values IPE 173

Method: Acid extractable (So-called totals)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	mg/kg	46.1	11.9	25.7	56	46.0	7.68	1.98	4.30

Method: Other determinations

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
delta 13C	‰ V-PDB	-29.4	0.182	0.6	10	-29.3	0.120	0.072	0.245
delta 15N	‰ Air	2.95	0.267	9.0	9	3.00	0.150	0.111	3.77

Method: Nutritional values

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Crude fibre	g/kg	251	33.3	13.3	19	246	19.4	9.55	3.80
ADF-ash-free	g/kg	389	55.7	14.3	11	387	38.6	21.0	5.40
NDF-ash-free	g/kg	506	64.6	12.8	10	493	47.0	25.5	5.05
Total ash	g/kg	67.8	3.48	5.1	35	67.7	2.28	0.735	1.08



Indicative Values IPE 173

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
As	µg/kg	84.3	32.4	38.4	40	89.0	18.2	6.40	7.60
Br	mg/kg	3.53	0.922	26.1	7	3.90	0.550	0.436	12.3
Li	µg/kg	81.0	55.0	67.9	11	83.4	38.6	20.7	25.6
Bi	µg/kg	5.36	2.00	37.3	5	5.33	1.25	1.12	20.9
Sn	µg/kg	78.7	31.4	39.8	10	79.0	12.0	12.4	15.8
Ti	mg/kg	1.90	1.88	98.6	8	2.30	1.40	0.829	43.6
Be	µg/kg	3.59	0.647	18.0	4	3.75	0.345	0.404	11.3
N - NH4 (as N)	mg/kg	435	142	32.7	8	443	93.9	62.8	14.4

Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	mg/kg	71.0	29.6	41.7	37	72.0	17.0	6.09	8.57
Si	mg/kg	1832	918	50.1	6	2115	642	468	25.6

Method: Nutritional values

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Total fat	g/kg	23.1	12.5	54.2	12	25.0	9.46	4.51	19.5