



**WAGENINGEN EVALUATING PROGRAMS
FOR ANALYTICAL LABORATORIES**

Certificate of Analysis



International Plant-Analytical Exchange

REFERENCE MATERIAL

IPE sample 257



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 257 of Banana leaves / *Musa sapientum*, from Ecuador, 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
2025	2	3



Consensus Values IPE 257

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B	mg/kg	53.7	6.34	11.8	79	54.1	3.90	0.891	1.66
Cu	mg/kg	8.12	0.887	10.9	93	8.16	0.569	0.115	1.42
Fe	mg/kg	404	57.3	14.2	91	405	34.9	7.51	1.86
Mn	mg/kg	445	33.6	7.6	90	443	21.4	4.43	0.996
Zn	mg/kg	30.6	2.78	9.1	91	30.6	2.25	0.364	1.19
As	µg/kg	123	15.1	12.3	20	123	10.4	4.23	3.42
Cd	µg/kg	10.9	1.11	10.2	19	11.0	0.700	0.319	2.93
Co	µg/kg	180	24.6	13.7	22	179	14.9	6.55	3.65
Hg	µg/kg	23.1	3.26	14.1	18	23.0	1.46	0.961	4.17
Mo	µg/kg	477	57.9	12.2	29	475	42.0	13.4	2.82
Ni	µg/kg	1450	184	12.7	26	1437	106	45.1	3.11
Pb	µg/kg	208	30.0	14.5	21	209	19.6	8.19	3.94
Se	µg/kg	138	18.1	13.1	16	137	11.6	5.66	4.11
Ba	mg/kg	18.2	2.49	13.7	12	18.0	1.50	0.900	4.94
Sr	mg/kg	39.2	3.20	8.2	9	40.5	2.46	1.33	3.40
Ca	g/kg	11.4	0.726	6.3	95	11.4	0.485	0.093	0.814
Cl (as Cl)	g/kg	10.4	1.06	10.2	17	10.4	0.520	0.320	3.08
K	g/kg	35.0	2.31	6.6	99	35.0	1.80	0.290	0.829
Mg	g/kg	2.73	0.186	6.8	94	2.74	0.115	0.024	0.879
N - Kjeldahl (as N)	g/kg	25.1	1.14	4.5	58	25.1	0.803	0.187	0.745
P (as P)	g/kg	1.72	0.101	5.9	100	1.71	0.062	0.013	0.736
S (as S)	g/kg	2.01	0.201	10.0	55	2.03	0.130	0.034	1.69

Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
C - elementary	g/kg	438	12.8	2.9	41	438	7.28	2.50	0.571
N - elementary	g/kg	26.5	0.767	2.9	58	26.5	0.415	0.126	0.475

Method: Acid extractable (So-called totals)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	mg/kg	266	58.5	22.0	20	265	40.8	16.4	6.14

Method: Other determinations

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
delta 13C	‰ V-PDB	-27.8	0.201	0.7	12	-27.8	0.121	0.073	0.261
delta 15N	‰ Air	1.46	0.235	16.0	12	1.40	0.095	0.085	5.78



Method: Nutritional values

Element

Total ash

Consensus Values IPE 257



Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
g/kg	150	6.59	4.4	15	151	3.90	2.13	1.41



Indicative Values IPE 257

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Cr	µg/kg	1133	347	30.6	25	1142	248	86.8	7.66
Sb	µg/kg	14.2	7.14	50.2	4	14.2	3.50	4.46	31.4
Ti	mg/kg	21.5	6.15	28.6	5	21.1	3.10	3.44	16.0
V	µg/kg	1383	320	23.1	13	1425	230	111	8.01
N - NO3 (as N)	mg/kg	50.3	15.9	31.6	5	48.4	9.38	8.87	17.6
Na	mg/kg	49.2	33.1	67.2	51	55.7	24.5	5.79	11.8

Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	mg/kg	421	224	53.3	8	388	129	99.1	23.5
S - elementary	g/kg	1.93	0.233	12.1	5	1.97	0.071	0.131	6.75

Method: Nutritional values

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Crude fibre	g/kg	252	30.4	12.1	6	260	20.9	15.5	6.15
Total fat	g/kg	38.5	11.7	30.5	6	40.2	4.45	5.99	15.6