WAGENINGEN EVALUATING PROGRAMS

FOR ANALYTICAL LABORATORIES

Certificate of Analysis

International Plant-Analytical Exchange

REFERENCE MATERIAL

IPE sample 949

WAGENINGEN
UNIVERSITY & RESEARCH

Certificate of Analysis IPE 949

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 949 of Aubergine (plant) / Solanum melongena l., from Netherlands, is prepared for the WEPAL proficiency programs. The sample has been used in 16 periods (or rounds). Only results from the last 5 periods are used. This way, the consensus values reflect the latest 'state of the art' analytical techniques used by the laboratories.It also gives a better estimate of the concentrations of non-stable or volatile determinands. The results on which the values in this report are based were taken from the periods given in the following table:

Year	Round	Number
2016	4	1
2012	2	3
2008	4	3
2008	3	4
2008	2	1

Consensus Values IPE 949

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B	mg/kg	18.2	1.70	9.4	378	18.2	1.10	0.109	0.602
Cu	mg/kg	6.64	0.588	8.8	516	6.67	0.345	0.032	0.487
Fe	mg/kg	203	21.0	10.3	520	204	13.4	1.15	0.567
Mn	mg/kg	19.9	1.71	8.6	532	20.0	1.00	0.092	0.464
Zn	mg/kg	104	6.37	6.1	534	104	4.15	0.344	0.331
As	µg/kg	288	26.3	9.1	103	287	15.0	3.24	1.13
Cd	µg/kg	413	30.9	7.5	194	413	19.5	2.78	0.672
Co	µg/kg	101	20.8	20.6	111	102	13.3	2.47	2.44
Cr	µg/kg	528	80.8	15.3	130	540	47.5	8.86	1.68
Hg	µg/kg	4.07	0.523	12.8	73	4.15	0.350	0.077	1.88
Li	µg/kg	4119	618	15.0	29	4103	349	143	3.48
Mo	µg/kg	532	61.0	11.4	136	533	41.2	6.53	1.23
Ni	µg/kg	433	53.2	12.3	124	440	31.0	5.97	1.38
Pb	µg/kg	899	116	12.9	173	911	73.0	11.0	1.23
Ba	mg/kg	2.75	0.427	15.5	48	2.79	0.287	0.077	2.80
V	µg/kg	450	85.6	19.0	51	444	46.0	15.0	3.33
Sr	mg/kg	26.8	1.85	6.9	62	26.7	1.00	0.294	1.10
Be	µg/kg	10.2	1.70	16.7	26	10.0	1.00	0.416	4.10
Rb	µg/kg	5155	360	7.0	25	5122	192	89.9	1.74
Ca	g/kg	11.4	0.653	5.7	554	11.5	0.436	0.035	0.303
Cl (as Cl)	g/kg	3.79	0.223	5.9	105	3.79	0.110	0.027	0.716
K	g/kg	23.2	1.25	5.4	566	23.3	0.760	0.066	0.283
Mg	g/kg	1.60	0.103	6.4	565	1.60	0.060	0.005	0.338
N - Kjeldahl (as N)	g/kg	14.4	0.950	6.6	388	14.4	0.600	0.060	0.419
N - NO3 (as N)	mg/kg	4629	317	6.8	49	4617	189	56.5	1.22
Na	mg/kg	242	31.2	12.9	320	243	19.7	2.18	0.899
P (as P)	g/kg	2.02	0.116	5.7	564	2.01	0.078	0.006	0.301
S (as S)	g/kg	1.25	0.083	6.7	311	1.25	0.050	0.006	0.475

Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
C - elementary	g/kg	439	11.6	2.6	162	439	7.75	1.14	0.259
Al	mg/kg	284	87.5	30.9	55	300	57.3	14.8	5.20
N - elementary	g/kg	16.6	0.950	5.7	248	16.6	0.600	0.075	0.454

Consensus Values IPE 949

Method: Acid extractable (So-called totals)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	mg/kg	202	42.3	20.9	108	203	27.0	5.09	2.52

Method: Other determinations

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
delta 13C	‰ V-PDB	-27.8	0.366	1.3	33	-27.8	0.260	0.080	0.287
delta 15N	‰ Air	3.64	0.743	20.4	40	3.67	0.530	0.147	4.04

Method: Nutritional values

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Crude fibre	g/kg	532	32.5	6.1	26	528	15.0	7.97	1.50
ADF-ash-free	g/kg	602	26.7	4.4	14	597	18.6	8.93	1.48
NDF-ash-free	g/kg	699	13.5	1.9	11	699	6.50	5.09	0.728
Total ash	g/kg	81.5	4.34	5.3	48	81.7	2.70	0.782	0.960

Indicative Values IPE 949

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
F	mg/kg	3.54	1.97	55.6	6	3.77	0.865	1.00	28.4
Br	mg/kg	20.9	5.21	24.9	8	21.2	2.39	2.30	11.0
Ga	µg/kg	70.1	28.0	40.0	9	67.0	16.1	11.7	16.6
I	µg/kg	120	41.5	34.5	19	129	31.2	11.9	9.90
Se	µg/kg	15.5	8.34	53.9	49	17.0	6.95	1.49	9.62
Bi	µg/kg	2.88	2.12	73.8	13	3.06	1.41	0.736	25.6
Sb	µg/kg	17.8	6.86	38.6	26	18.2	4.75	1.68	9.47
Sn	µg/kg	1361	394	29.0	31	1330	233	88.5	6.51
Ti	mg/kg	3.82	2.16	56.7	18	4.57	1.55	0.638	16.7
Ag	µg/kg	8.10	4.49	55.4	13	9.10	3.47	1.56	19.2
Cs	µg/kg	47.4	11.4	23.9	12	47.1	6.25	4.10	8.64
N - NH4 (as N)	mg/kg	702	184	26.2	16	704	94.6	57.5	8.20
SO4 (as SO4)	g/kg	1.40	0.435	31.2	21	1.43	0.370	0.119	8.50

Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Si	mg/kg	1319	422	32.0	7	1345	225	199	15.1

Method: Nutritional values

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Total fat	g/kg	7.56	4.01	53.0	17	7.56	2.46	1.21	16.1