WAGENINGEN EVALUATING PROGRAMS

FOR ANALYTICAL LABORATORIES

Certificate of Analysis

International Plant-Analytical Exchange

REFERENCE MATERIAL

IPE sample 166

WAGENINGEN
UNIVERSITY & RESEARCH

Certificate of Analysis IPE 166

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 166 of Cherry Laurel / Prunes laurocerasus, from Netherlands, is prepared for the WEPAL proficiency programs. The sample has been used in 5 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
2018	3	3
2013	1	3
2009	1	3
2005	4	2
2005	3	2

Consensus Values IPE 166

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B	mg/kg	18.1	1.86	10.3	416	18.1	1.10	0.114	0.629
Cu	mg/kg	6.61	0.675	10.2	579	6.60	0.400	0.035	0.531
Fe	mg/kg	76.3	9.18	12.0	580	76.4	5.84	0.477	0.625
Mn	mg/kg	101	6.38	6.3	592	101	4.00	0.328	0.324
Zn	mg/kg	31.6	2.31	7.3	607	31.6	1.40	0.117	0.371
As	µg/kg	58.7	9.99	17.0	105	59.7	6.30	1.22	2.08
Br	mg/kg	1.27	0.212	16.6	24	1.30	0.130	0.054	4.24
Cd	µg/kg	75.4	9.48	12.6	192	75.1	5.55	0.856	1.13
Co	µg/kg	119	22.7	19.2	134	120	14.0	2.45	2.07
Cr	µg/kg	381	135	35.5	149	396	87.0	13.8	3.63
Hg	µg/kg	29.4	2.01	6.8	112	29.4	1.20	0.237	0.808
Li	µg/kg	50.3	8.85	17.6	21	50.7	4.70	2.41	4.79
Mo	µg/kg	523	56.3	10.8	139	524	32.0	5.97	1.14
Ni	µg/kg	998	137	13.7	172	1010	86.0	13.0	1.31
Pb	µg/kg	742	88.4	11.9	199	748	52.9	7.83	1.06
Ba	mg/kg	14.1	1.37	9.7	76	14.1	0.900	0.197	1.39
Sb	µg/kg	58.4	8.70	14.9	51	59.2	5.20	1.52	2.61
V	µg/kg	112	21.7	19.4	51	115	14.0	3.81	3.39
Sr	mg/kg	36.8	2.66	7.2	74	36.7	1.88	0.387	1.05
Cs	µg/kg	17.2	2.50	14.5	18	17.3	1.78	0.737	4.28
Rb	µg/kg	11371	1065	9.4	41	11327	673	208	1.83
Ca	g/kg	15.6	1.02	6.5	634	15.6	0.610	0.051	0.324
K	g/kg	11.2	0.666	5.9	653	11.2	0.410	0.033	0.291
Mg	g/kg	2.35	0.140	6.0	627	2.35	0.081	0.007	0.297
N - Kjeldahl (as N)	g/kg	12.4	0.663	5.3	407	12.4	0.406	0.041	0.331
Na	mg/kg	42.1	24.3	57.6	349	45.2	15.4	1.62	3.86
P (as P)	g/kg	2.42	0.126	5.2	619	2.42	0.081	0.006	0.262
S (as S)	g/kg	0.764	0.100	13.0	340	0.768	0.062	0.007	0.884

Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
C - elementary	g/kg	480	11.4	2.4	140	479	7.00	1.20	0.251
Al	mg/kg	51.4	11.2	21.8	40	53.8	5.15	2.21	4.31
N - elementary	g/kg	12.9	0.626	4.9	238	12.9	0.378	0.051	0.394

Consensus Values IPE 166

Method: Acid extractable (So-called totals)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	mg/kg	38.2	9.10	23.8	137	39.0	5.30	0.972	2.54

Method: Other determinations

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
delta 13C	‰ V-PDB	-28.8	0.240	0.8	10	-28.8	0.150	0.095	0.330

Method: Nutritional values

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Crude fibre	g/kg	217	21.3	9.8	31	219	10.6	4.78	2.20
ADF-ash-free	g/kg	382	34.1	8.9	14	382	18.7	11.4	2.98
NDF-ash-free	g/kg	463	41.6	9.0	13	454	21.1	14.4	3.11
Total ash	g/kg	63.9	3.66	5.7	57	63.7	2.31	0.606	0.949

Indicative Values IPE 166

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Ga	µg/kg	25.8	12.7	49.2	4	27.0	6.65	7.94	30.8
I	µg/kg	162	51.1	31.6	18	173	32.0	15.0	9.31
Se	µg/kg	24.4	9.16	37.5	53	26.1	6.10	1.57	6.45
Bi	µg/kg	5.28	2.23	42.3	13	5.20	1.10	0.774	14.7
Sn	µg/kg	68.4	32.6	47.6	20	73.7	22.6	9.11	13.3
Ti	mg/kg	2.48	1.94	78.2	15	2.75	1.34	0.625	25.2
Ag	µg/kg	6.66	3.96	59.4	11	7.60	2.40	1.49	22.4
Be	µg/kg	3.22	1.41	43.8	17	3.21	0.640	0.427	13.3
Cl (as Cl)	g/kg	0.302	0.202	67.0	113	0.318	0.128	0.024	7.88
N - NH4 (as N)	mg/kg	42.6	27.5	64.6	13	55.0	20.7	9.53	22.4
N - NO3 (as N)	mg/kg	18.9	16.9	89.7	36	22.2	11.7	3.53	18.7
SO4 (as SO4)	g/kg	0.345	0.255	73.8	15	0.391	0.148	0.082	23.8

Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Si	mg/kg	364	189	51.9	5	354	124	106	29.0

Method: Acid extractable (So-called totals)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Si	mg/kg	242	201	82.9	8	273	128	88.7	36.6

Method: Other determinations

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
delta 15N	‰ Air	-0.758	0.423	55.8	9	-0.700	0.220	0.176	23.3

Method: Nutritional values

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
NDF-ash-containing	g/kg	484	61.8	12.8	4	479	28.5	38.6	7.99
Total fat	g/kg	20.1	14.2	70.5	16	17.9	7.75	4.42	22.0