



**WAGENINGEN EVALUATING PROGRAMS
FOR ANALYTICAL LABORATORIES**

Certificate of Analysis



International Plant-Analytical Exchange

REFERENCE MATERIAL

IPE sample 951



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 mean and standard deviation are calculated using all reported data when at least 8 results are left after removal of reported 'lower than' (<) and 0 (= zero) values. No outliers are removed.

This report is divided into three sections: Consensus Values, Indicative Values and Values for Information. The division is made on the reliability of the data. Consensus Values are based on at least 16 results while the coefficient of variation is smaller than 25 %. Indicative Values are based on at least 8 and less than 16 results or a coefficient of variation between 25 % and 50 %. Other values, based on more than 2 and less than 8 results or a coefficient of variation higher than 50 %, are given for information only.

In the sections with Consensus Values and Indicative Values the following parameters are given: mean, standard deviation, coefficient of variation, number of results, median and MAD (Median of Absolute Deviation) and the uncertainty in the consensus values. The confidence limits (at 95 % probability) are calculated for these determinands.

In the section with Information Values the following parameters are given: median, MAD and number of results. For determinands which have at least 5 results reported as smaller than (<) the median of these 'smaller than results' is calculated. In some cases this median of '<' values is much smaller than median and mean of the indicative values. This may be caused by a too optimistic (too low) value for the detection limit reported by a (small) majority of participating laboratories who report '<' -values.

All values, expressed on a weight basis (kg or %), are reported in oven dry (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 951 of Aubergine (leaf+fruit) / Solanum melongena L. from Netherlands is prepared for the WEPAL proficiency programs. The sample is 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
1998	3	3
1996	2	6
1990	3	5



Consensus Values IPE 951

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits	
As	µg/kg	1800	161	8.9	39	1800	115	32	1753	- 1857
B	mg/kg	95.4	10.53	11.0	213	95.6	7.37	0.90	93.9	- 96.8
Ba	mg/kg	9.96	2.458	24.7	21	9.95	1.650	0.670	8.84	- 11.1
Ca	g/kg	59.7	4.90	8.2	365	59.6	3.45	0.32	59.2	- 60.3
Cd	µg/kg	544	82.6	15.2	80	547	57.5	11.5	526	- 563
Cl (as Cl)	g/kg	8.52	0.688	8.1	82	8.58	0.487	0.095	8.37	- 8.67
Co	µg/kg	220	53.9	24.5	46	220	36.5	9.9	204	- 236
Cr	µg/kg	1810	428	23.6	64	1840	293	67	1705	- 1919
Cu	mg/kg	10.3	1.46	14.1	335	10.3	1.00	0.10	10.18	- 10.49
Fe	mg/kg	526	101.0	19.2	319	524	69.0	7.1	515	- 537
Hg	µg/kg	80.6	11.98	14.9	34	82.1	8.45	2.57	76.5	- 84.8
K	g/kg	47.8	3.50	7.3	382	47.6	2.42	0.22	47.47	- 48.18
Mg	g/kg	4.94	0.337	6.8	366	4.93	0.234	0.022	4.91	- 4.98
Mn	mg/kg	83.3	6.87	8.2	345	83.2	4.70	0.46	82.6	- 84.0
Mo	µg/kg	2460	473	19.2	51	2410	338	83	2330	- 2596
N - Kjeldahl (as N)	g/kg	33.1	2.79	8.4	277	33.1	1.92	0.21	32.81	- 33.47
N - NO3 (as N)	mg/kg	11900	570	4.8	60	11800	390	90	11764	- 12061
P (as P)	g/kg	4.08	0.228	5.6	374	4.09	0.155	0.015	4.06	- 4.10
Pb	µg/kg	6160	1368	22.2	84	6050	951	187	5862	- 6456
S (as S)	g/kg	3.93	0.327	8.3	145	3.91	0.224	0.034	3.88	- 3.99
Sr	mg/kg	94.3	7.17	7.6	25	94.8	5.23	1.79	91.3	- 97.2
V	µg/kg	1310	299	22.8	19	1340	211	86	1167	- 1455
Zn	mg/kg	107	8.8	8.2	345	106	6.0	0.6	105.9	- 107.8

Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits	
N - elementary	g/kg	38.7	2.39	6.2	88	38.7	1.61	0.32	38.2	- 39.2



Indicative Values IPE 951

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Li	µg/kg	36400	3400	9.3	12	36300	2320	1230	34270	-	38550
Na	mg/kg	230	83.0	36.0	241	230	57.5	6.7	220	-	241
Ni	µg/kg	1000	340	34.0	59	1000	240	55	914	-	1091
Se	µg/kg	38.0	12.86	33.9	17	38.0	9.10	3.90	31.4	-	44.6
SO4 (as SO4)	g/kg	5.07	1.612	31.8	17	5.09	1.153	0.489	4.24	-	5.89

Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
C - elementary	g/kg	332	11.1	3.4	14	330	7.7	3.7	326	-	338



Informative Values IPE 951



Method: Inorganic Chemical Composition

Element	Unit	Median	MAD	N
Be	µg/kg	25.0	11.00	9
Br	mg/kg	87.7	2.70	4
F	mg/kg	10.8	5.02	5
N - NH4 (as N)	mg/kg	869	224.2	7
Rb	µg/kg	10800	750	4
Sb	µg/kg	205	92.0	7
Sn	µg/kg	30300	2060	3
Ti	mg/kg	3.68	2.020	4

Method: Nutritional values

Element	Unit	Median	MAD	N
Total ash	g/kg	275	11.0	5