QUASIMEME

Quality assurance of information for marine environmental monitoring

Certificate of Analysis

Biota

REFERENCE MATERIAL

Biota sample 352

WAGENINGEN
UNIVERSITY & RESEARCH

Certificate of Analysis Biota 352

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 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 10 results while the relative uncertainty is smaller than 6.25%. Indicative Values are based on a relative uncertainty of maximum 35% with at least 4 and less than 10 results or a relative uncertainty higher than 6.25%.

For each determinand the following parameters are given: mean, standard deviation, coefficient of variation, number of results, median, MAD (Median of Absolute Deviation) and the uncertainty in the assigned value. The confidence limits (at 95 % probabilty) are calculated for these determinands.

The results of each determinand is expressed on a wet weight basis.

Sample information

QUASIMEME reference materials cover a range of natural Biota species from contaminated waters from the North Sea and/or Mediterranean. The supplied wet test materials are homogenised and sterilised by autoclaving.

This Biota sample 352 of Mussels (artificial contaminated) from Yerseke, the Netherlands is prepared for the QUASIMEME proficiency programs. The results on which the values in this report are based were taken from the periods given in the following table.

Year.Round	Program	Sample Round Id
2021.1	BT2	QOR147BT
2020.2	BT4	QPH099BT
2020.2	BT8	QSP075BT
2018.2	BT4	QPH091BT
2018.1	BT2	QOR135BT
2017.2	BT8	QSP063BT
2017.1	BT4	QPH086BT

Consensus Values BT2

Method: Chlorinated organics - BT2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
PCB28	µg/kg	0.125	0.0283	22.6	33	0.130	0.0200	0.0062	0.115 - 0.135
PCB52	µg/kg	0.203	0.0524	25.8	34	0.213	0.0350	0.0112	0.185 - 0.221
PCB101	µg/kg	0.759	0.1541	20.3	42	0.794	0.1040	0.0297	0.711 - 0.807
PCB105	µg/kg	0.165	0.0349	21.1	22	0.165	0.0240	0.0093	0.150 - 0.181
PCB118	µg/kg	0.609	0.0919	15.1	40	0.613	0.0630	0.0182	0.580 - 0.639
PCB138	µg/kg	1.40	0.194	13.9	37	1.43	0.140	0.040	1.33 - 1.46
PCB153	µg/kg	2.56	0.431	16.8	43	2.59	0.310	0.082	2.42 - 2.69
PCB156	µg/kg	0.0780	0.0132	16.9	16	0.0810	0.0094	0.0041	0.0710 - 0.0850
PCB180	µg/kg	0.0970	0.0150	15.5	29	0.1000	0.0110	0.0035	0.0913 - 0.103
b-HCH	µg/kg	6.13	1.457	23.8	28	6.11	1.003	0.344	5.57 - 6.70
pp'-DDD	µg/kg	3.37	0.609	18.1	37	3.31	0.390	0.125	3.17 - 3.57
pp'-DDE	µg/kg	2.48	0.399	16.1	37	2.47	0.260	0.082	2.35 - 2.62

Method: Lipids - BT2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
Total-Lipid	%	2.05	0.338	16.5	21	2.00	0.218	0.092	1.89 - 2.20
Extractable-Lipid	%	2.07	0.222	10.7	11	2.13	0.160	0.084	1.92 - 2.21

Indicative Values BT2

Method: Chlorinated organics - BT2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
PCB31	µg/kg	0.103	0.0254	24.8	14	0.103	0.0162	0.0085	0.0882 - 0.117
PCB138+PCB163	µg/kg	1.42	0.097	6.8	8	1.44	0.062	0.043	1.34 - 1.50
a-HCH	µg/kg	0.592	0.2282	38.6	30	0.595	0.1465	0.0521	0.507 - 0.677
g-HCH	µg/kg	0.295	0.1166	39.6	28	0.323	0.0795	0.0276	0.249 - 0.340
d-HCH	µg/kg	0.758	0.2478	32.7	12	0.765	0.1770	0.0894	0.602 - 0.914
HCB	µg/kg	1.28	0.464	36.4	36	1.30	0.307	0.097	1.12 - 1.43
HCBD	µg/kg	0.199	0.0542	27.2	5	0.218	0.0400	0.0303	0.137 - 0.262
Dieldrin	µg/kg	7.84	1.994	25.4	16	8.01	1.370	0.623	6.79 - 8.90
op'-DDT	µg/kg	0.0370	0.0106	28.6	7	0.0400	0.0070	0.0050	0.0275 - 0.0464
pp'-DDT	µg/kg	0.0733	0.0547	74.6	16	0.1220	0.0475	0.0171	0.0443 - 0.102
Transnonachlor	µg/kg	0.0475	0.0201	42.2	7	0.0520	0.0150	0.0095	0.0296 - 0.0654
Heptachlor-epoxide (sum)	(µg/kg)	0.0235	0.0077	32.7	5	0.0257	0.0057	0.0043	0.0147 - 0.0323

Consensus Values BT4

Method: Polycyclic aromatic hydrocarbons - BT4

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
Anthracene	µg/kg	4.13	0.574	13.9	56	4.10	0.403	0.096	3.98 - 4.29
Benzo[a]anthracene	µg/kg	1.28	0.281	21.9	57	1.35	0.200	0.047	1.21 - 1.36
Benzo[a]pyrene	µg/kg	2.62	0.744	28.4	63	2.70	0.530	0.117	2.43 - 2.80
Benzo[b]fluoranthene	µg/kg	3.50	0.808	23.1	51	3.59	0.570	0.141	3.28 - 3.73
Benzo[e]pyrene	µg/kg	1.88	0.358	19.0	23	2.00	0.270	0.093	1.73 - 2.04
Benzo[g,h,i]perylene	µg/kg	2.60	0.404	15.6	49	2.65	0.280	0.072	2.48 - 2.71
Benzo[k]fluoranthene	µg/kg	1.26	0.242	19.2	47	1.31	0.170	0.044	1.19 - 1.33
Chrysene	µg/kg	1.95	0.376	19.3	47	2.05	0.255	0.069	1.84 - 2.06
Fluoranthene	µg/kg	17.4	3.36	19.3	61	17.4	2.30	0.54	16.5 - 18.3
Phenanthrene	µg/kg	19.3	4.76	24.7	57	19.4	3.31	0.79	18.1 - 20.6
Pyrene	µg/kg	4.40	1.261	28.7	53	4.60	0.900	0.217	4.05 - 4.75

Method: Lipids - BT4

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
Total-Lipid	%	1.93	0.340	17.6	26	1.97	0.230	0.083	1.80 - 2.07

Indicative Values BT4

Method: Polycyclic aromatic hydrocarbons - BT4

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
Acenaphthene	µg/kg	1.32	0.609	46.2	43	1.43	0.430	0.116	1.13 - 1.51
Acenaphthylene	µg/kg	0.461	0.2289	49.6	32	0.505	0.1610	0.0506	0.379 - 0.544
Benzo[a]fluorene	µg/kg	0.466	0.0865	18.6	5	0.490	0.0670	0.0484	0.367 - 0.566
Benzofluoranthenes (a+b+j+k)	µg/kg	4.74	2.069	43.6	7	5.40	1.330	0.977	2.90 - 6.59
Chrysene + Triphenylene	µg/kg	2.55	1.008	39.5	17	2.44	0.750	0.306	2.04 - 3.07
Dibenz[ah]anthracene	µg/kg	0.105	0.0677	64.5	28	0.128	0.0500	0.0160	0.0788 - 0.131
Dibenzothiophene	µg/kg	0.669	0.2374	35.5	19	0.754	0.1637	0.0681	0.555 - 0.783
Fluorene	µg/kg	1.47	0.605	41.2	47	1.54	0.430	0.110	1.29 - 1.65
Indeno[1,2,3-cd]pyrene	µg/kg	0.777	0.2740	35.2	49	0.836	0.1940	0.0489	0.699 - 0.856
Naphthalene	µg/kg	1.73	1.550	89.8	36	2.24	1.165	0.323	1.20 - 2.25
Perylene	µg/kg	0.565	0.2636	46.7	16	0.660	0.1800	0.0824	0.425 - 0.704
Triphenylene	µg/kg	0.701	0.0945	13.5	7	0.700	0.0680	0.0446	0.617 - 0.786
1-methylnaphtalene	µg/kg	0.579	0.4988	86.1	13	0.700	0.3903	0.1729	0.281 - 0.878
2-methylnaphtalene	µg/kg	0.509	0.3732	73.3	11	0.780	0.2842	0.1407	0.261 - 0.757
2-methylphenanthrene	µg/kg	1.86	0.391	21.0	14	1.93	0.299	0.130	1.64 - 2.09
3-6-dimethylphenanthrene	µg/kg	0.302	0.0593	19.6	8	0.313	0.0452	0.0262	0.254 - 0.350
1-methylpyrene	µg/kg	0.307	0.0436	14.2	7	0.310	0.0300	0.0206	0.268 - 0.346
C1-phenanthrenes/anthracenes	µg/kg	7.54	2.661	35.3	11	7.90	1.831	1.003	5.77 - 9.31
C2-phenanthrenes/anthracenes	µg/kg	3.44	1.792	52.1	10	4.23	1.305	0.708	2.17 - 4.70
C1-pyrenes/fluoranthenes	µg/kg	4.73	0.305	6.5	7	4.75	0.212	0.144	4.46 - 5.00
C1-chrysenes	µg/kg	0.901	0.1256	13.9	6	0.955	0.1010	0.0641	0.776 - 1.03

Indicative Values BT8

Method: Organometals - BT8

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
Dibutyltin (DBT)	µg Sn/kg	2.01	0.727	36.2	12	2.18	0.523	0.262	1.55 - 2.47
Monobutyltin (MBT)	µg Sn/kg	1.60	0.460	28.8	14	1.71	0.316	0.154	1.33 - 1.86
Tributyltin (TBT)	µg Sn/kg	6.80	1.792	26.3	18	6.83	1.276	0.528	5.91 - 7.69