The National Marine Biological
Analytical Quality Control Scheme
www.nmbaqcs.org

Macrobenthic Exercise Results – MB20

Year 19

amended

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Thomson Unicomarine Ltd.
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EXERCISE DETAILS

Macrobenthos:	#20
Type/Contents:	Natural marine sample from Breydon Water;
	0.5 mm sieve mesh processing.
Circulated:	28/09/2012
Completion Date:	14/12/2012
Number of Participating Laboratories:	6
Number of Results Received:	6

Contents

LabCode	LB1901
SampleCode	MB20
Sample Received	06/12/2012
Notes	No biomass

Summary Data	
Diff. In No. Taxa	**0**
Diff. In No. Individuals	**-4**
Missed Taxa (in residue)	**0**
Missed Individuals (in residue)	**2**
Taxonomic Errors	**2**
Count Variance (excl. residue)	**-2**
Biomass %diff.	**-**
Bray-Curtis Similarity index	**82.05**

	Participating Laboratory			**Thomson Unicomarine Ltd.**			
Taxon Number	Taxon Name	Number	Biomass	Taxon Name	Number	Biomass	Comments
1	Hediste diversicolor	9	-	Hediste diversicolor	9	-	
2	Nereididae sp. juv	1	-	Nereididae sp. juv.	**3**	-	Count error
3	Corophium volutator	44	-	Corophium volutator	44	-	
4	Cyathura carinata	5	-	Cyathura carinata	5	-	
5	Spiophanes bombyx	3	-	Spiophanes bombyx	3	-	
6	Peringia ulvae	11	-	**Ecrobia ventrosa**	11	-	Taxonomic error
7	Amage sp	1	-	**Alkmaria romijni**	1	-	Taxonomic error
8	Corophidae sp	P	-	Corophidae sp.	P	-	Corophium volutator
9	Streblospio shrubsolii	2	-	Streblospio sp.	2	-	Species complex (over confident id. by PL)
10	Polychaeta	P	-	Polychaeta	P	-	Hediste diversicolor
Additional taxa from within taxon pots							
-				-	-	-	
Taxa not picked from residue							
				Ecrobia ventrosa	2	-	Repeat taxon
		76	0		80	0	

Number of taxa PL: 8 TUM: 8

(Fragments highlighted in blue-grey, not counted for stats.)

LabCode	LB1902
SampleCode	MB20
Sample Received	11/12/2012
Notes	No biomass

Summary Data	
Diff. In No. Taxa	**-1**
Diff. In No. Individuals	**2**
Missed Taxa (in residue)	**1**
Missed Individuals (in residue)	**2**
Taxonomic Errors	**0**
Count Variance (excl. residue)	**4**
Biomass %diff.	**-**
Bray-Curtis Similarity index	**96.10**

	Participating Laboratory			**Thomson Unicomarine Ltd.**			
Taxon Number	Taxon Name	Number	Biomass	Taxon Name	Number	Biomass	Comments
1	Hediste diversicolor	5	-	Hediste diversicolor	5	-	
2	Cyathura carinata	5	-	Cyathura carinata	5	-	
3	Corophium volutator	26	-	Corophium volutator	26	-	
4	Ventrosia ventrosa	14	-	**Ecrobia** ventrosa	**10**	-	Name change; count error (only orifices counted)
5	Podocopida	27	-	Podocopida	27	-	bad condition
6	Alkmaria romijni	1	-	Alkmaria romijni	1	-	
Additional taxa from within taxon pots							
-				-	-	-	-
Taxa not picked from residue							
				Nematoda	2	-	New taxon
				Hediste diversicolor	P		
		78	0		76	0	

Number of taxa PL: 6 TUM: 7

(Fragments highlighted in blue-grey, not counted for stats.)

LabCode	LB1903
SampleCode	MB20
Sample Received	11/01/2013
Notes	No biomass

Summary Data	
Diff. In No. Taxa	**1**
Diff. In No. Individuals	**-1**
Missed Taxa (in residue)	**0**
Missed Individuals (in residue)	**1**
Taxonomic Errors	**1**
Count Variance (excl. residue)	**0**
Biomass %diff.	**-**
Bray-Curtis Similarity index	**99.29**

	Participating Laboratory			**Thomson Unicomarine Ltd.**			
Taxon Number	Taxon Name	Number	Biomass	Taxon Name	Number	Biomass	Comments
1	Corophium volutator	26	-	Corophium volutator	26	-	
2	Cyathura carinata	2	-	Cyathura carinata	2	-	
3	Corophium sp.	P	-	Corophium sp.	P	-	Corophium volutator
4	Ophiothrix fragilis	P	-	Ophiothrix fragilis	P	-	
5	Streblospio shrubsolii	1	-	Streblospio sp.	1	-	Species complex (over confident id. by PL)
6	Hediste diversicolor	8	-	Hediste diversicolor	8	-	
7	Hydrobia ulvae	5	-	**Ecrobia ventrosa**	5	-	Taxonomic error
8	Hediste	P	-	Hediste sp.	P	-	Hediste diversicolor
9	polychaete (Hedistes jaw)	P	-	Hediste jaw	P	-	
10	Ventrosia ventrosa	24	-	**Ecrobia** ventrosa	24	-	Name change; repeat taxon
11	Macoma balthica	1	-	Macoma balthica	1	-	
12	Ostracod indet	3	-	Ostracoda	3	-	Podocopida, bad condition
Additional taxa from within taxon pots							
-				-	-	-	
Taxa not picked from residue							
				Streblospio sp.	1	-	Repeat taxon
		70	0		71	0	

Number of taxa PL: 8 TUM: 7

(Fragments highlighted in blue-grey, not counted for stats.)

LabCode	LB1904
SampleCode	MB20
Sample Received	14/12/2012
Notes	

Summary Data

Diff. In No. Taxa	**-1**
Diff. In No. Individuals	**-9**
Missed Taxa (in residue)	**1**
Missed Individuals (in residue)	**5**
Taxonomic Errors	**2**
Count Variance (excl. residue)	**-4**
Biomass %diff.	**16.97**
Bray-Curtis Similarity index	**90.53**

	Participating Laboratory			**Thomson Unicomarine Ltd.**			
Taxon Number	Taxon Name	Number	Biomass	Taxon Name	Number	Biomass	Comments
1	Hediste diversicolor	12	0.7452	Hediste diversicolor	12	0.6292	
2	Ampharete sp. Juv	1	0.0001	**Alkmaria romijni**	1	0.0002	Taxonomic error
3	Corophium volutator	20	0.0756	Corophium volutator	20	0.0487	
4	Cyathura carinata	4	0.028	Cyathura carinata	4	0.0253	
5	Macoma balthica	3	0.0126	Macoma balthica	3	0.0119	
6	Hydrobia ulvae	3	0.0004	**Ecrobia ventrosa**	3	0.0003	Taxonomic error
7	Hydrobia (dead)	-	-	Ecrobia ventrosa (dead)	-	-	No need to include
Additional taxa from within taxon pots							
7				Ecrobia ventrosa	4		Found amongst dead shells; repeat taxon Biomass: 0.0041, ignored for stats.
Taxa not picked from residue							
				Podocopida	2		New taxon; biomass : 0.0002, ignored for stats.
				Ecrobia ventrosa	3		Repeat taxon; biomass 0.0026, ignored for stats.
		43	0.8619		52	0.7156	

Number of taxa PL: 6 TUM: 7

LabCode	LB1907
SampleCode	MB20
Sample Received	14/12/2012
Notes	No electronic data supplied

Summary Data	
Diff. In No. Taxa	**0**
Diff. In No. Individuals	**5**
Missed Taxa (in residue)	**0**
Missed Individuals (in residue)	**0**
Taxonomic Errors	**0**
Count Variance (excl. residue)	**5**
Biomass %diff.	**8.97**
Bray-Curtis Similarity index	**96.62**

	Participating Laboratory			**Thomson Unicomarine Ltd.**			
Taxon Number	Taxon Name	Number	Biomass	Taxon Name	Number	Biomass	Comments
1	Streblospio shrubsolii	6	0.003	Streblospio sp.	6	0.0018	Species complex (over confident id. by PL)
2	Hediste diversicolor	18	0.487	Hediste diversicolor	**19**	0.4293	Count error
3	Glycinde nordmanni	1	0.002	Glycinde nordmanni	1	0.0002	
4	Cyathura carinata	4	0.029	Cyathura carinata	4	0.0321	
5	Scrobicularia plana	1	0.003	**Scrobicularia plana juv.**	1	0.0032	
6	Podocopida	3	0.0001	Podocopida	3	0.0001	Bad condition
7	Ecrobia ventrosa	13	0.01	Ecrobia ventrosa	**8**	0.0107	Count error (only orifices counted)
8	Corophium volutator	59	0.139	Corophium volutator	**58**	0.1361	Count error
9	Crangon crangon	1	0.001	Crangon crangon	1	0.0001	
Additional taxa from within taxon pots							
-				-	-	-	
Taxa not picked from residue							
		106	0.6741		101	0.6136	

Number of taxa PL: 9 TUM: 9

LabCode	LB1922
SampleCode	MB20
Sample Received	04/01/2013
Notes	

Summary Data	
Diff. In No. Taxa	**0**
Diff. In No. Individuals	**-12**
Missed Taxa (in residue)	**0**
Missed Individuals (in residue)	**7**
Taxonomic Errors	**2**
Count Variance (excl. residue)	**-5**
Biomass %diff.	**9.90**
Bray-Curtis Similarity index	**95.43**

	Participating Laboratory			**Thomson Unicomarine Ltd.**			
Taxon Number	Taxon Name	Number	Biomass	Taxon Name	Number	Biomass	Comments
1	Hediste diversicolor	9	0.5961	Hediste diversicolor	9	0.5272	
2	Nereidinae	11	0.0089	Nereididae juv.	11	0.0088	
3	Corophium volutator	26	0.0928	Corophium volutator	**25**	0.0799	Count error
4	Corophiini	4	0.0010	Corophiini	4	0.0017	Corophium volutator juv.
5	Corophiini*	5	0.0051	Corophiini	5	0.0149	Corophium volutator juv.
6	Cyathura carinata	3	0.0018	Cyathura carinata	3	0.0023	
7	Crangon crangon	1	0.0017	Crangon crangon	1	0.0022	
8	Macoma balthica	1	-	**Scrobicularia plana juv.**	1	-	Taxonomic error; biomass: 0.0001, ignored for stats.
9	Ecrobia ventrosa	8	-	Ecrobia ventrosa	8		Biomass: 0.0085, ignored for stats.
10	Ostrocoda	67	-	Ostracoda	67	-	Podocopida, bad condition; biomass: 0.0002, ignored for stats.
11	Foraminifera	P	-	Foraminifera	P	-	
12	Streblospio	-	-	Streblospio sp.	**5**	-	Count error; biomass: 0.0006, ignored for stats.
13	Alkmaria romijni	1	-	Alkmaria romijni	**2**	-	Count error; biomass: 0.0001, ignored for stats.
14	Caulleriella serrata	1	0.0008	**Aphelochaeta marioni**	1	0.0011	Taxonomic error
Additional taxa from within taxon pots							
-				-	-	-	
Taxa not picked from residue							
				Nereididae juv.	1	-	Repeat taxon; biomass: 0.0001, ignored for stats.
				Ecrobia ventrosa	6	-	Repeat taxon; biomass: 0.0065, ignored for stats.
		137	0.7082		149	0.6381	

Number of taxa PL: 12 TUM: 12

*repeat taxa, not included in taxa count
(Fragments highlighted in blue-grey, not counted for stats.)

Table 1. Results from the analysis of Macrobenthic sample MB20 by the participating laboratories.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Number of Taxa				Number of Individuals				Not extracted			Individuals	Similarity	Taxonomic
LabCode	PL	TUM	Diff (n)	%max	PL	TUM	Diff (n)	%max	New Taxa	Ind	%ind	Count Error	index	errors
LB1901	8	8	0	0.0	76	80	-4	5.0	0	2	2.5	-2	82.05	2
LB1902	6	7	-1	14.3	78	76	2	2.6	1	2	2.6	4	96.10	0
LB1903	8	7	1	12.5	70	71	-1	1.4	0	1	1.4	0	99.29	1
LB1904	6	7	-1	14.3	43	52	-9	17.3	1	5	9.6	-4	90.53	2
LB1907	9	9	0	0.0	106	101	5	4.7	0	0	0.0	5	96.62	0
LB1922	12	12	0	0.0	137	149	-12	8.1	0	7	4.7	-5	95.43	2

Key: PL - participating laboratory
TUM - Thomson Unicomarine Ltd.

Table 2. Comparison of the efficiency of extraction of fauna by the participating laboratories for the major taxanomic groups present in sample MB20.

LabCode		Nemertea	Polychaeta	Oligochaeta	Chelicerata	Crustacea	Echinoderm	Mollusca	Other	Overall
LB1901	TUM count	-	18	-	-	49	-	13	-	80
	PL missed	-	0	-	-	0	-	2	-	2
	%missed	-	0.0	-	-	0.0	-	15.4	-	2.5
LB1902	TUM count	-	6	-	-	58	-	10	2	76
	PL missed	-	0	-	-	0	-	0	2	2
	%missed	-	0.0	-	-	0.0	-	0.0	100.0	2.6
LB1903	TUM count	-	10	-	-	31	-	30	-	71
	PL missed	-	1	-	-	0	-	0	-	1
	%missed	-	10.0	-	-	0.0	-	0.0	-	1.4
LB1904	TUM count	-	13	-	-	26	-	13	-	52
	PL missed	-	0	-	-	2	-	3	-	5
	%missed	-	0.0	-	-	7.7	-	23.1	-	9.6
LB1907	TUM count	-	26	-	-	66	-	9	-	101
	PL missed	-	0	-	-	0	-	0	-	0
	%missed	-	0.0	-	-	0.0	-	0.0	-	0.0
LB1922	TUM count	-	29	-	-	105	-	15	-	149
	PL missed	-	1	-	-	0	-	6	-	7
	%missed	-	3.4	-	-	0.0	-	40.0	-	4.7

Key: PL missed - individuals not picked from residue by participating laboratory
TUM count - total number of individuals counted by Thomson Unicomarine Ltd.
"-" - No data

Table 3. Comparison of the estimates of biomass made by the participating laboratories with those made by Unicomarine Ltd. for the major taxonomic groups present in sample MB20. Values are in grams (g).

LabCode		Nemertea	Polychaeta	Oligochaeta	Chelicerata	Crustacea	Echinoderm	Mollusca	Other	Overall
LB1901	PL	-	-	-	-	-	-	-	-	-
	TUM	-	NO BIOMASS DATA						-	-
	%diff.	-	-	-	-	-	-	-	-	-
LB1902	PL	-	-	-	-	-	-	-	-	-
	TUM	-	NO BIOMASS DATA						-	-
	%diff.	-	-	-	-	-	-	-	-	-
LB1903	PL	-	-	-	-	-	-	-	-	-
	TUM	-	NO BIOMASS DATA						-	-
	%diff.	-	-	-	-	-	-	-	-	-
LB1904	PL	-	0.7453	-	-	0.1036	-	0.013	-	0.8619
	TUM	-	0.6294	-	-	0.074	-	0.0122	-	0.7156
	%diff.	-	15.6	-	-	28.6	-	6.2	-	17.0
LB1907	PL	-	0.492	-	-	0.1691	-	0.013	-	0.6741
	TUM	-	0.4313	-	-	0.1684	-	0.0139	-	0.6136
	%diff.	-	12.3	-	-	0.4	-	-6.9	-	9.0
LB1922	PL	-	0.6058	-	-	0.1024	-	-	-	0.7082
	TUM	-	0.5371	-	-	0.101	-	-	-	0.6381
	%diff.	-	11.3	-	-	1.4	-	-	-	9.9

Key: PL - participating laboratory
TUM - Thomson Unicomarine Ltd.
"-" - No data.

Table 4. Variation in faunal content of samples distributed as MB20.

Taxa*

LabCode	Nemertea	Polychaeta	Oligochaeta	Chelicerata	Crustacea	Echinoderm	Mollusca	Other	Total taxa
LB1901	-	5	-	-	2	-	1	0	8
LB1902	-	2	-	-	3	-	1	1	7
LB1903	-	2	-	-	3	-	2	0	7
LB1904	-	2	-	-	3	-	2	0	7
LB1907	-	3	-	-	4	-	2	0	9
LB1922	-	5	-	-	5	-	2	0	12
Mean	-	3.2	-	-	3.3	-	1.7	0.2	8.3
Max	-	5	-	-	5	-	2	1	12
Min	-	2	-	-	2	-	1	0	7

Individuals*

LabCode	Nemertea	Polychaeta	Oligochaeta	Chelicerata	Crustacea	Echinoderm	Mollusca	Other	Total Ind.
LB1901	-	18	-	-	49	-	13	0	80
LB1902	-	6	-	-	58	-	10	2	76
LB1903	-	10	-	-	31	-	30	0	71
LB1904	-	13	-	-	26	-	13	0	52
LB1907	-	26	-	-	66	-	9	0	101
LB1922	-	29	-	-	105	-	15	0	149
Mean	-	17.0	-	-	55.8	-	15.0	0.3	88.2
Max	-	29	-	-	105	-	30	2	149
Min	-	6	-	-	26	-	9	0	52

Key: "*" - TUM data used for all faunal groups
"-" - No data
"0" - Zero values used in calculation of mean

Figure 1. MB20 data from participating laboratories (raw - untransformed).

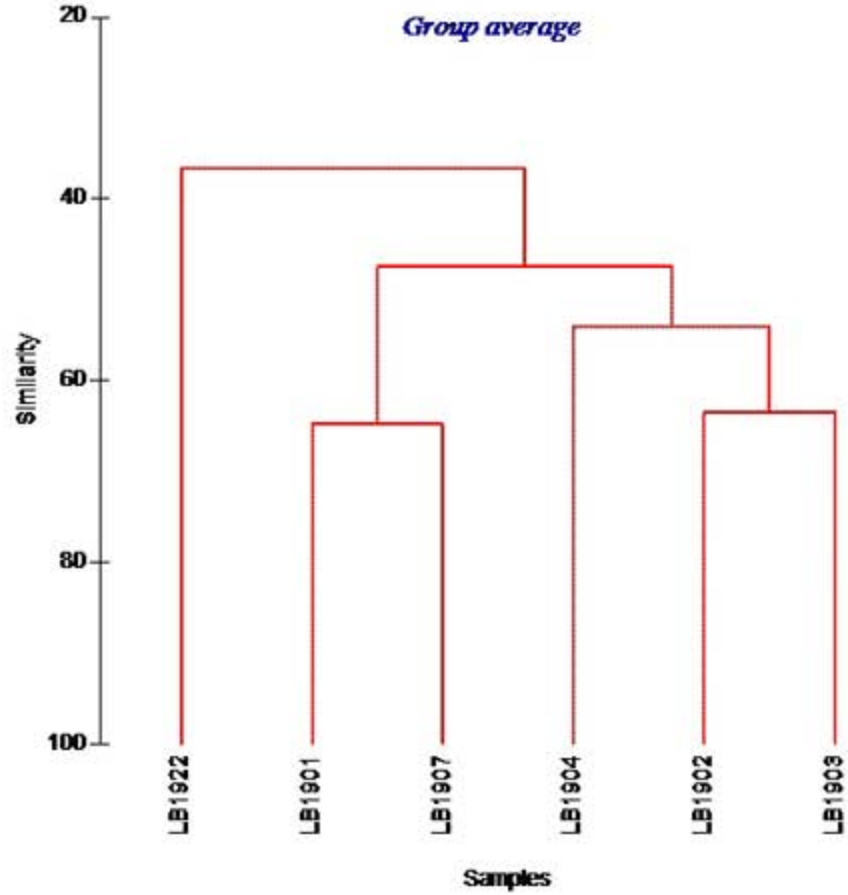
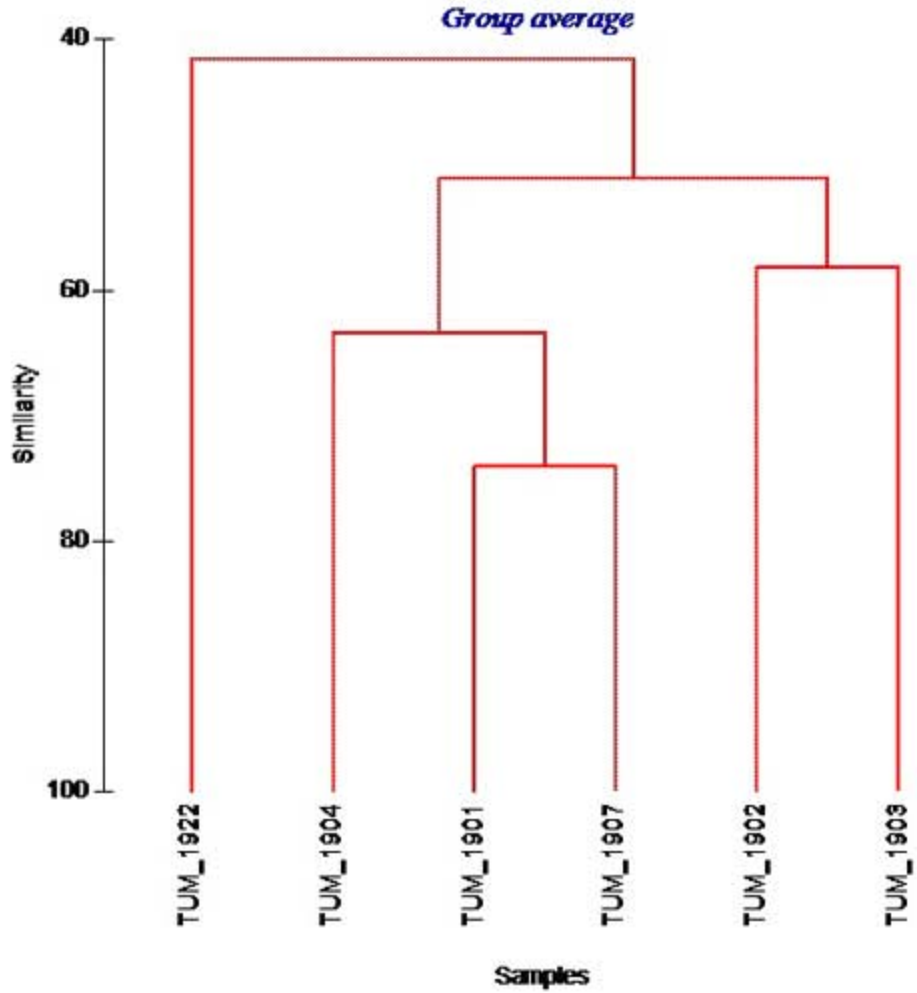


Figure 2. MB20 data re-analysed by Thomson Unicomarine Ltd. (untransformed).



National Marine Biological Analytical Quality Control Scheme

Benthic Invertebrate Component - Macrobenthic sample exercise (MB)

Objective:

- To examine the consistency of extraction and identification of taxa from similar samples

The macrobenthic sample is a training exercise; results are not used to assess the performance of a laboratory.

Protocol:

Each participating laboratory receives a prepared, labelled macrobenthic sample in a sealed pot with minimal alcohol as a temporary preservative. Samples may be either 'natural' ($0.1m^2$ grabs) or artificially created uniform samples. 'Natural' samples are collected on the same day and from the same location at anchor. A single unsorted sample is distributed per Scheme year. Participating laboratories are required to sort and extract all biota, identify to the most accurate taxonomic level practicable, usually species, and enumerate according to the Scheme's processing requirements protocol (PRP) and taxonomic discrimination protocol (TDP). Biomass (blotted wet-weight) values are required for all taxa.

Reporting compares extraction efficiency, identification accuracy, enumeration accuracy and biomass estimates. Participating laboratory *vs.* Thomson Unicomarine Ltd. data set for each sample are compared using the Bray-Curtis similarity index.

Preparation:

Samples should be sieved (0.5 mm) and preserved (if not processed immediately) by the participating laboratory on receipt. Sorted residue and specimens should be returned to Thomson Unicomarine Ltd., where natural samples are re-processed.

Timescale:

Please send results, specimens and sample residues to Thomson Unicomarine Ltd. by **14th December 2012.**