

QAQC Report on Aquatic Macroinvertebrate Samples

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Per contract between Environmental Resource Management (ERM) of Holland, Michigan, and the Michigan Natural Features Inventory (MNFI), Dr. Jo A. Latimore performed a taxonomic classification quality control check on three aquatic macroinvertebrate samples, initially identified to the taxonomic level of family.

Methods

Samples were received separated into vials, one vial per taxonomic family. Each vial was emptied into an open dish and inspected under a dissecting microscope. The identification of all individuals in each vial was confirmed. In the case of misidentified individuals, the correct classification was determined and the misidentified individuals were removed from the original vial and placed in a correctly labeled vial.

Absolute numbers of individuals in vials were confirmed with the exception of the few vials containing more than 25 individuals. In these cases, the originally determined totals were presumed to be accurate.

Taxonomic determinations were confirmed with reference to Bouchard (2004), Merritt and Cummins (1996), Pennak (1978) and Rogers and Hill (2008).

Complete results of the identification check were tabulated, including the original and corrected counts for each taxon in each sample and notes on any corrections made. These tables are attached. The results are summarized below.

Summary of Results

Sample ID	Collection Date	Initial Taxa	Corrected Taxa	Initial Individuals	Corrected Individuals	Misidentified Individuals	Other Errors*
AQ2	8/20/08	25	27	207	203	33	7
AQ4	7/17/09	30	35	345	347	5	2
AQ9	7/15/09	30	31	240	244	3	3

* "Other errors" include the number of individuals subject to miscounts, failures to include a taxon on the data sheet although the vial was included in the collection, one case of a small individual hidden in a vial of large individuals of another taxon, and one case of a larval coleopteran recorded as an adult.

Process Notes

All samples were received in good condition. All samples were contained in standard sample vials with the exception of one sample of several large Macromiidae individuals that was contained in a non-standard plastic container temporarily sealed with paraffin film. A good seal could not be achieved after opening this container, so the samples were moved to a wide-mouth Nalgene container. In those cases when new taxa were identified, a new vial similar to those originally used was added to contain those individuals.

The use of Sharpie or similar semi-permanent marker on the outside of sample vials containing alcohol preservative is not recommended, especially in the absence of any other labeling. Such inks are soluble in alcohol, which is easily splashed on the outside of the vial when they are opened for examination. Ideally, vials should contain a paper label printed in pencil or insoluble ink with all pertinent sample information. Information can then be repeated on the outside of the vial for convenience, as appropriate.

Several vials included individuals represented only by empty shells or larval cases. As it appeared that these were counted as individuals in the original data, this practice was continued during the QAQC process. For example, most gastropod and bivalve individuals were represented only by empty shells, and many caddisflies were represented only by empty larval cases. Counting empty structures as live individuals from a sampled habitat is not necessarily standard practice, and such data should be interpreted with caution.

References

Bouchard, R.W., Jr. 2004. Guide to aquatic invertebrates of the Upper Midwest. University of Minnesota, St. Paul, Minnesota.

Merritt, R.W., and K.W. Cummins, eds. 1996. An introduction to the aquatic insects of North America, 3rd ed. Kendall/Hunt, Dubuque, Iowa.

Pennak, R.W. 1978. Fresh-water invertebrates of the United States. Wiley, New York.

Rogers, D.C. and M. Hill. 2008. Key to the freshwater Malacostraca (Crustacea) of the Mid-Atlantic region. EPA-230-R-08-017. US Environmental Protection Agency, Office of Environmental Information, Environmental Analysis Division, Washington, D.C.

Taxon	Original Count	Corrected Count	QAQC Notes
Talitridae	152	152	
Baetidae	95	91	Subtract 4 misidentified individuals.
Caenidae	4	5	Counting error - there were 5 individuals in the vial.
Ephemerellidae	6	0	Multiple errors - counting (there was only 1 individual in the vial) and it was misidentified.
Heptageniidae	4	13	Add 7 initially misidentified as Leptophlebiidae and 2 initially misidentified as Baetidae.
Isonychiidae	0	1	Add 1 initially misidentified as Baetidae.
Leptophlebiidae	9	4	Subtract 7 misidentified individuals; add 1 initially misidentified as Baetidae and 1 as Ephemerellidae.
Tricorythidae	1	1	
Macromiidae	1	1	
Coenagrionidae	28	28	
Glossosomatidae	1	1	
Helicopsychidae	9	9	
Hydropsychidae	8	7	Subtract 1 misidentified individual.
Hydroptilidae	3	3	
Limnephilidae	5	5	
Odontoceridae	0	1	Add 1 initially misidentified as Philopotamidae.
Philopotamidae	5	1	Subtract 4 misidentified individuals.
Polycentropodidae	7	12	Add 1 initially misidentified as Chironomidae, 1 as Hydropsychidae, and 3 as Philopotamidae.
Psychomyiidae	1	1	
Elmidae	13	13	
Gyrinidae (a)	1	0	Data recording error - individual is a larva, not an adult.
Gyrinidae (l)	0	1	Correction of data recording error - individual was recorded as an adult.
Hydrophilidae	2	2	
Psephenidae (a)	2	2	
Chironomidae	115	114	Subtract 1 misidentified individual.
Physidae	0	16	Add 16 initially misidentified as Valvatidae.
Pleuroceridae	1	1	
Valvatidae	28	12	Subtract 16 misidentified individuals.
Sphaeriidae	6	6	
TOTAL	507	503	
No. of Taxa	25	27	

Taxon	Original Count	Corrected Count	QAQC Notes
Hirudinea	1	1	
Talitridae	167	167	
Decapoda	0	1	Data recording error - vial in collection but not recorded on sheet.
Asellidae	30	30	
Baetidae	12	12	
Caenidae	3	3	
Aeshnidae	7	7	
Gomphidae	14	14	
Libellulidae	2	2	
Macromiidae	14	14	
Coenagrionidae	20	20	
Corixidae	1	1	
Gerridae	2	2	
Corydalidae	7	7	
Sialidae	7	7	
Hydropsychidae	0	1	Data recording error - vial in collection but not recorded on sheet.
Hydroptilidae	4	4	
Leptoceridae	1	1	
Limnephilidae	1	1	
Polycentropodidae	5	5	
Psychomyiidae	1	1	
Pyralidae	4	4	
Dytiscidae	5	4	Subtract 1 misidentified individual.
Elmidae	5	5	
Gyrinidae (I)	5	5	
Halplidae (I)	2	2	
Hydrophilidae	0	1	Add 1 initially misidentified as Dytiscidae.
Chironomidae	12	12	
Simuliidae	1	1	
Tabanidae	4	4	
Lymnaeidae	0	1	Add 1 initially misidentified as Valvatidae.
Physidae	0	3	Add 3 initially misidentified as Valvatidae.
Planorbidae	1	1	
Pleuroceridae	1	1	
Valvatidae	6	2	Subtract 4 misidentified individuals.
Sphaeriidae	1	1	
TOTAL	345	347	
No. of Taxa	30	35	

Taxon	Original Count	Corrected Count	QAQC Notes
Talitridae	48	48	
Gammaridae	32	32	
Asellidae	1	1	
Hydracarina	1	1	
Baetidae	2	4	Counting error - 4 individuals in vial.
Caenidae	2	2	
Heptageniidae	2	2	
Isonychiidae	0	3	Add 3 initially misidentified as Oligoneuriidae.
Leptophlebiidae	3	3	
Tricorythidae	1	1	
Oligoneuriidae	3	0	Subtract 3 misidentified individuals.
Aeshnidae	3	3	
Cordulegastridae	3	3	
Gomphidae	18	18	
Libellulidae	1	1	
Macromiidae	1	1	
Coenagrionidae	4	4	
Perlidae	19	19	
Mesoveliidae	1	1	
Corydalidae	10	10	
Helicopsychidae	1	1	
Hydropsychidae	14	14	
Limnephilidae	18	18	
Philopotamidae	21	22	Add 1 individual hidden among Limnephilidae.
Elmidae	11	11	
Gyrinidae (a)	1	1	
Haliplidae (a)	1	1	
Chironomidae	6	6	
Simuliidae	0	1	Data recording error - vial in collection but not recorded on data sheet.
Planorbidae	4	4	
Valvatidae	2	2	
Sphaeriidae	6	6	
TOTAL	240	244	
No. of Taxa	30	31	