

The ostracod microbiotest with *Heterocypris incongruens* as an alternative screening solid phase assay to the conventional sediment contact test with *Hyalella azteca*

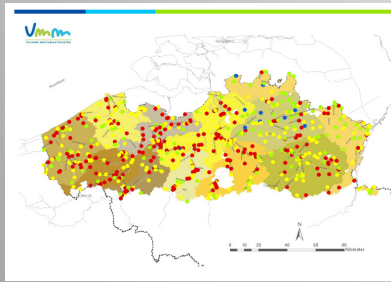
W. De Cooman¹ and G. Persoone^{2,3}

¹ Flemish Environment Agency (VMM), Department Water Reporting, Belgium

² Laboratory for Environmental Toxicology and Aquatic Ecology, Ghent University, Gent, Belgium

³ MicroBioTests Inc., Mariakerke (Gent), Belgium

Sediments are the centre of intense biological activity which co-determine the good ecological functioning of all aquatic ecosystems, and which are affected by pollutants that accumulate in the sediments. Besides assays on the pore water, the toxicological impact of sediment contaminants in freshwater bodies is presently also determined with “solid phase tests” on selected benthic species. In analogy to other “culture/maintenance free” Toxkit microbiotests - which are to date used extensively for toxicity testing of contaminated waters - a “direct contact” microbiotest has been developed for sediment toxicity testing with the ostracod crustacean *Heterocypris incongruens*.



Sampling sites of the sediment quality monitoring network in Flanders, Belgium

Over the last 8 years, river sediments of the hydrographic basin in Flanders, Belgium, have been monitored annually for their toxicity with both the conventional *Hyalella azteca* assay and the Ostracodtoxkit microbiotest.



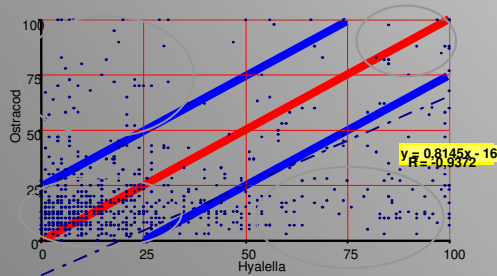
Heterocypris incongruens
(150-200 µm)

Hyalella azteca
(1800-2000 µm)



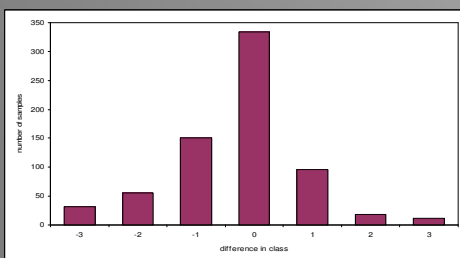
Comparison of about 700 data pairs from a network of 600 sampling sites revealed that the responses of both assays was similar for the majority of sediment samples.

For the other samples, it was either the ostracod or the amphipod test species which was more sensitive.



Major characteristics of the 2 solid phase assays

	Ostracodtoxkit	Hyalella assay
Type of organism	Ostracod crustacean	Amphipod crustacean
Origin of test organism	Dormant eggs (cysts)	Live stock cultures
Age of test organisms	Freshly hatched neonates	7-14 days old juveniles
Size of test organisms	150-200 µm	1800-2000 µm
Test containers	6 well microplates (10 ml wells)	Glass jars (1 L)
Volume of sediment per container	1 ml	200 ml
Volume of water per container	4 ml	800 ml
Number of replicates	6	5
Number of organisms per replicate	10	20
Test duration	6 days	10 days
Effect criterion	Mortality Growth inhibition	Mortality



The converted responses of the *Heterocypris incongruens* microbiotest in an ecotoxicological class - used in the triad approach to rank the ecological status of sediments in Flanders - is for the majority of samples identical to the class calculated with the conventional *Hyalella* test and only differs by one class for most other samples.

CONCLUSION

The similar sensitivity, the practicality and the cost-efficiency of the alternative solid phase Ostracodtoxkit microbiotest are important assets worth to be taken into consideration for routine toxicity monitoring to rank contaminated sediments.