

Sediment-Water *Hyalella* Reproduction Test: Challenges Using Plant Material as Food Source.

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For Environmental Risk Assessments in the frame of several legislations, toxicity tests with sediment dwellers have to be conducted. Some legislations offer the chance to reduce an assessment factor when results for three different species are provided. Internationally accepted guidelines exist for *Lumbriculus* (OECD 225), *Chironomus* (OECD 218/219) and *Hyalella* (ASTM E1706). All test designs represent sediment-water compartments. However, according to the OECD and ASTM guidelines, there are two serious differences regarding the feeding regimes for strongly adsorbing substances.

According to the OECD guidelines, ingestion of contaminated food may be a significant exposure route and therefore, the use of food added to the sediment before application of the test substance may be considered. In such a case, finely ground plant material added to the formulated sediment before test substance application must be used instead of frequently applied fish-food suspension via the overlying water. According to the ASTM E1706 guideline, such a feeding regime is not considered. Independent from the test substance properties, always food suspensions have to be applied frequently via the overlying water.

This may be one reasons why the OECD currently develops an own sediment-water *Hyalella* guideline considering different feeding regimes. An international ring test is announced for 2023 and 2024. However, one problem regarding a change in food source and quality could be a reduced survival rate, growth and maybe a total lack of reproduction within the test duration of six weeks. So far, no guideline, ring test or research project published regarding adverse effects of chemicals on *Hyalella* development and reproduction in a sediment-water test system used plant material as the only food source.

In this project we aim to perform valid modified sediment-water *Hyhallee azteca* reproduction tests following ASTM E1706 in a flow-through test system using finely ground plant material as the only food source. First results obtained that problems can arise regarding i) fungal growth on the sediment surface and ii) surpassing the threshold value for survival rate. Results for effects on reproduction are outstanding and further tests regarding the origin for the problems (composition of artificial sediment, overlying water quality, food source (species used for plant material), temperature, static/flow-through test system) are currently running.