Session 4.01.P-Mo274 | Advances in Environmental Risk Assessment of Chemicals
Date: Monday, 1 May 2023, 08.45 – 18.45
Conference Room: The Convention Centre Dublin - The Forum - Exhibition Hall (Ground Level)

Sediment-Water Chironomid Toxicity Test – Experiences Using a Flow-Through Device.

Markus Simon[1]

[1]Fraunhofer Institute for Molecular Biology and Applied Ecology IME, Schmallenberg, Germany
E-mail contact: ime.fraunhofer.de

Keywords: Chirnonomids, sediment dweller, reproduction, flow-through test design, food source

For Environmental Risk Assessments in the frame of several legislations, toxicity tests with sediment dwellers have to be conducted. Internationally accepted OECD guidelines exist for *Lumbriculus* (OECD 225) and *Chironomus* (OECD 218/219). All test designs represent sediment-water compartments. Even when the standard test design is static without water renewal, semi-static or flow-through systems are accepted in exceptional cases (e.g. if water quality become inappropriate for the chironomids). Such exceptional cases could also be unstable substances, or precipitating metal salts in spiked water test designs.

Despite of most other aquatic or sediment dwelling standard test organisms applied in ecotoxicity tests, chironomids show a holometabolous life cycle starting from a larvae living in and on the sediment surface and ending as a midge, emerging from a pupae at the water surface. Test vessels in chronic tests looking for emergence rate, therefore have to be sealed with emergence traps. This, and the circumstance that the chironomids are inserted as first instar larvae into the overlying water makes the application of a flow-through test system challanging. Additionally, food availability – in most cases a fish food suspension applied via overlying water – could be limited depending on the water exchange rate, affecting the survival rate.

The aim was to perform valid 28-day Sediment-Water Chironomid tests according to OECD 218/219 in a flow-through test system. An adapted flow-through test system developed for *Daphnia* Reproduction Tests was used. First results obtained that the test system ensure remaining of all larvae and pupae in the vessels but promlems can arise regarding survival rate when frequently applying fish food suspension as food source. Results for test designs applying more frequently fish food suspension or plant material incorporated into the sadiment before test start are are currently running and tests comparing the influence of static test design versus flow-through test design on effect concentrations are outstanding.