

What Food and Feeding Rates Are Optimum for the *Chironomus dilutus* Sediment Toxicity Test Method?

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Laboratory tests with benthic macroinvertebrates conducted using standard toxicity test procedures are used to assess the potential toxicity of contaminated sediments. Results are compared across sites or for batches of samples, and the performance of organisms in control treatments must be reproducible and reliable. As the use of 10-d and long-term sediment toxicity testing is more prevalent, refinements are needed for the reliability and consistency of test results. Various factors can affect control performance and affect the interpretation of the test. In 10-d tests, growth in midge (*Chironomus dilutus*) test has been shown to increase with increases in the feeding rate and test replicates that were stocked with fewer organisms had larger weights at the end of 10-d exposures. Surplus food may cause a decrease in dissolved oxygen concentrations that could lead to false-positive conclusions; insufficient food may stunt growth in control treatments and lead to false-negative conclusions. Determining an optimal feeding rate would allow for high rates of growth in control or non-toxic sediments so that adverse effects would be easy to distinguish, but at the same time would not result in reduce overlying water quality if all of the food is not consumed due to organism mortality or growth impairment. In a series of experiments, we evaluated various food types and quantities; we tested various rations of coarse ground and blended formulations of Tetrafin® and Tetramin® flake food, two grasses (wheat, alfalfa), Sera micron, and spinach under flow-through conditions. Growth was measured at 4, 7, and 10 day to develop growth curves for the various food additions. Recommendations on the types and quantity of the foods used will be presented. *This abstract does not necessarily reflect USEPA policy.*

Key words: Sediment tests, *Chironomus dilutus*, feeding studies, toxicity

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