

SETAC NA Abstract

Effects of Feeding and Organism Loading Rate on PCB Accumulation by *Lumbriculus variegatus* in Sediment Bioaccumulation Testing

Lawrence P. Burkhard*, Dylan Hubin-Barrows, Nanditha Billa, Terry L. Highland, J. Russell Hockett,
Dale J. Hoff, David R. Mount, and Teresa Norberg-King,

Sediment bioaccumulation test methods published by USEPA and ASTM in 2000 specify that the *Lumbriculus variegatus*, a freshwater oligochaete, should not be fed during the 28-day exposure and recommends an organism loading rate of total organic carbon in sediment to organism dry weight of no less than 50:1. It is commonly observed with sediments from Superfund sites that the *L. variegatus* weights decrease over the 28-day exposure period and that many tests are performed with ratios of total organic carbon in sediment to organism dry weight of less than 50:1, particularly when sediment organic carbon is low (e.g., <0.5%). A series of bioaccumulation tests were performed to evaluate the influence of feeding and loading rate upon the growth and contaminant bioaccumulation by the organisms.

With sediments contaminated with polychlorinated biphenyls (PCBs), accumulations of PCBs in *L. variegatus* were similar between loading rates of approximately 50:1 and 25:1. For loading rates greater than 50:1, accumulation of PCBs tended to be less than those at the 50:1 loading rate. In contrast, for loading rates less than 25:1, accumulation of PCBs tended to be greater than those at the 50:1 loading rate. In most but not all sediments tested, PCB accumulation patterns were similar at all levels of chlorination. Weight change during the exposures varied considerably among sediments, but organisms receiving supplemental food (TetraMin®) had higher ending weights compared to unfed organisms tested in the same sediment. Organisms provided flaked fish food in the form of fine flakes had higher ending weights than those fed the same food in the form of a blended suspension of the same food. Results from both the loading rate and feeding exposures will be presented and recommendations discussed.

This abstract does not necessarily reflect U.S. EPA policy.