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Adaptation to mercury contamination in an aquatic oligochaete worm

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ABSTRACT

Resistance to contaminants is an important yet unmeasured factor in sediment toxicity tests. The rate at which mercury resistance develops and its genetic persistence in the oligochaete worm *Tubifex tubifex* were studied under laboratory conditions. Two populations of *T. tubifex* worms were raised for four generations each in clean and mercurycontaminated sediments, respectively. Mercury resistance was determined by comparative water-only toxicity tests, with mercury as the only stressor. *T. tubifex* exposed to high levels of mercury in sediment showed high mercury resistance during laboratory exposures. Resistance in these worms was rapidly acquired and inherited by subsequent generations. The mean LC_{50} for control worms was 0.18 mgL^{-1}. The mean LC_{50} for mercury-reared worms was 1.40 mgL^{-1}. Furthermore, crosses between resistant and less resistant worms grown in control sediment resulted in offspring with high mercury resistance (LC_{50}=1.39 mgL^{-1}), thus demonstrating genetic adaptation to mercury. Development of contaminant resistance and adaptation may be common phenomena in aquatic benthic invertebrates, and should be considered during the design and interpretation of toxicity tests.

Full Text

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