Phenotypic and Behavioral Defects Induced by Iron Exposure Can Be Transferred to Progeny in Caenorhabditis elegans

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Abstract

Previous work has shown that excess iron accumulation is harmful to reproduction and even promotes death; however, whether the multiple biological toxicity of iron (Fe) exposure could be transferred to progeny remains unknown. The present study used Caenorhabditis elegans to analyze the multiple toxicities of iron exposure and their possible transferable properties.

Methods

Three concentrations of iron sulfate solution (2.5 μmol/L, 75 μmol/L, and 200 μmol/L) were used. The endpoints of lifespan, body size, generation time, brood size, head thrash and body bend frequencies, and chemotaxis plasticity were selected to investigate Fe toxicity and its effect on progeny in Caenorhabditis elegans.

Results

The Fe toxicity could cause multiple biological defects in a dose-dependent manner by affecting different endpoints in nematodes. Most of the multiple biological defects and behavior toxicities could be transferred from Fe-exposed Caenorhabditis elegans to their progeny. Compared to the parents, no recovery phenotypes were observed for some of the defects in the progeny, such as body bend frequency and life span. We further summarized the defects caused by Fe exposure into 2 groups according to their transferable properties.

Key words: Iron toxicosis; Transferable; Phenotype; Behavior; C. elegans

References


Transferring multiple biological defects and behavior toxicities from Fe-exposed Caenorhabditis elegans to their progeny. Compared to the parents, no recovery phenotypes were observed for some of the defects in the progeny, such as body bend frequency and life span. We further summarized the defects caused by Fe exposure into 2 groups according to their transferable properties.

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(Received February 17, 2007 Accepted December 20, 2007)