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The thickness of digestive gland epithelium as biomarkers of stress in terrestrial isopod *Porcellio scaber*

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We investigated histological changes in the digestive glands of *Porcellio scaber* (Crustacea, Isopoda) after exposure to elevated concentrations of metals (Cd, Zn, Hg). Toxicity testing and monitoring of pollution with terrestrial isopods is generally based on effects of chemicals at different levels of biological organization. However, the tissue level biomarkers have been largely overlooked. The aim of our investigation was to identify dose-dependent histological parameters for the digestive glands of *P. scaber*. We studied the effects of zinc, cadmium and mercury after feeding the animals with metal dosed food for 4, 7, 14, 21, 28 or 34 days. The general experimental setup followed the protocol of Drobne and Hopkin (1995, Ecotox Environ Safe 31:1-6). At the end of exposure, five animals per treatment were dissected; digestive gland tubes were fixed, stained and prepared for light microscopy. Several histological parameters were measured on serial sections using an image analysis system. Data analysis revealed that thickness of the epithelium showed both dose-dependence and relatively little variability along the gland tube. We observed also a correlation between the duration of treatments and epithelial thickness, indicating that the long-term exposure was stressful for both the control and the metal-treated animals. We conclude, that digestive gland epithelial thickness is a not specific tissue level biomarker of stress in *P. scaber*.