



Application of selected detoxifying and antioxidative enzymes of the *Tubifex tubifex* (*Oligochaeta*) as potential indicators of river sediment contamination

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ABSTRACT

Tissues of the oligochaete *Tubifex tubifex* were assayed for selected enzymatic biomarkers: superoxide dismutase (SOD), catalase (CAT), carboxylesterase (CarE), and glutathione-S-transferase (GST) in order to evaluate the possibility of applying those biomarkers in the process of evaluating the contamination of river sediments sampled from four rivers in Upper Silesia: Bajerka, Odra, Jamna, and Gostynia. The enzymatic activity in tissues of the sludge worm was measured after exposure periods of 4, 24, 72, and 168 h. The obtained data led to the conclusion that CarE activity reflects the level of contamination of the environmental sediment samples, not only with regard to organic compounds such as PAHs, but also heavy metals. In addition to the increase in CarE activity, a significant decrease in GST and CAT was noted for the sediment containing unacceptable PAH concentrations. Moreover, a strong response in the form of an increase in GST activity was observed after exposure to sediment contaminated with heavy metals. Thus, the analyzed enzymatic activities of *T. tubifex* could be considered a potentials biomarker of sediment contamination.

Keywords: River sediments; Oxidative stress; Oligochaete *Tubifex tubifex*; catalase; Glutathione-S-transferase; Carboxylesterase; Superoxide dismutase

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