

15th Euro Global Summit on

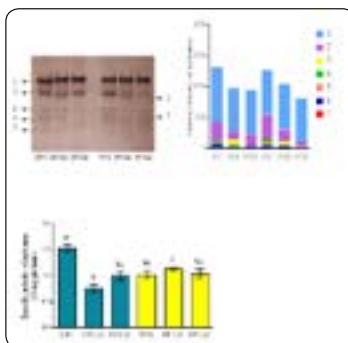
Toxicology and Applied Pharmacology

July 02-04, 2018 | Berlin, Germany

Influence of chronic dietary exposure to cadmium on midgut esterases in gypsy moth (*Lymantria dispar* L.) caterpillars

Vlahović Milena, Matić Dragana, Ilijin Larisa, Mrdaković Marija, Todorović Dajana, Grčić Anja and Perić Mataruga Vesna
University of Belgrade, Belgium

Cadmium ranks among the most toxic metals accumulating in the environment. We are searching for sensitive biomarkers relevant to forest ecosystems using gypsy moth, as it is a highly adapted and very prevalent insect species. We determined the activity and isozyme pattern of non-specific esterases in the midgut on the 3rd day of fourth instar larvae after exposure to cadmium (50 and 100 µg Cd/g dry food, Cd1 and Cd2, respectively) from hatching until sacrifice. The larvae originated from two locations, an unpolluted forest on Kosmaj mountain, 50 km far from Belgrade (UP), and the polluted Lipovica forest, located close to a main highway near Belgrade (PP). Published data about the role of esterases in metal detoxification are insufficient. The zymogram revealed at least seven isoforms. In larvae from the unpolluted locality both levels of cadmium (50 and 100 µg Cd/g dry food) led to significant inhibition of esterase activity compared to controls, while no effect of cadmium treatment occurred in caterpillars from the polluted locality. Enzyme activity in non-treated larvae was significantly higher in the Kosmaj population. The presence and intensity of the isoforms varied depending on cadmium treatment. The alterations and abundance depended on the metal concentration and pointed to a multifunctional role and possible involvement in the wide spectrum of physiological processes in stressful conditions. Therefore, specific activity of midgut esterase can be considered as a potential biomarker of dietary cadmium only in populations that originate from unpolluted sites.



Recent Publications:

1. Vlahović M et al. (2012) Changes in activity of non-specific esterases in cadmium treated *Lymantria dispar* larvae. *Ecotoxicology*. 21(2):370-378.
2. Vlahović M et al. (2014) Cadmium-induced changes of gypsy moth larval mass and protease activity *Comp. Biochem. Physiol. C Toxicol. Pharmacol.* 160:9-14.
3. Vlahović M et al. (2015) Alteration of the activities of trypsin and leucine aminopeptidase in gypsy moth caterpillars exposed to dietary cadmium. *Water, Air, Soil Pollut.* 226:387-400.
4. Matić D et al. (2016) Genotoxic effects of cadmium and influence on fitness components of *Lymantria dispar* caterpillars. *Environ. Poll.* 218:1270-1277.
5. Vlahović M et al. (2017) Influence of dietary cadmium exposure on fitness traits and its accumulation (with an overview on trace elements) in *Lymantria dispar* larvae. *Comp. Biochem. Physiol. C Toxicol. Pharmacol.* 200:27-33.

Biography

Vlahović Milena is a Senior Research Associate whose research focus includes (eco)toxicology of heavy metals, studying insects as bioindicators, monitoring metal influence on insect physiology and biochemistry, as well as the development of new biomarkers.

minavl@ibiss.bg.ac.rs