Assessment of glutathione peroxidase activity and lipid peroxidation status in *Lymnaea natalensis* freshwater snails, following chronic exposure to heavy metals

Sanele Mnkandla*, Andrew Siwela and Norah Basopo

Department of Applied Biology and Biochemistry, National University of Science and Technology, PO Box AC 939, Ascot, Bulawayo, Zimbabwe.

*Email: sanele.mnkandla@nust.ac.zw

Domestic and industrial effluent contain various contaminants, such as heavy metals, which are inadvertently released into aquatic bodies. A study on the Bulawayo Lower Mguza dam which receives effluent from the Bulawayo city showed high levels of the heavy metals cadmium, copper, lead and mercury in water. The present study therefore was aimed at assessing the activity of the antioxidant enzyme, glutathione peroxidase (GPx) as well as thiobarbituric acid reactive species (TBARS) levels from lipid peroxidation in *Lymnaea natalensis* snails, following chronic exposure to these heavy metals. Glutathione peroxidase is one of the defence mechanisms involved against peroxidative damage of lipids. Groups of snails were exposed to heavy metals at concentrations reportedly found in the Lower Mguza dam, for 28 days. Water and feed were changed daily, and samples were collected at 1, 7, 14, 21 and 28 day intervals before analysis. Copper exposures caused a significant increase in GPx activity on day 28 and significant decreases in TBARS levels from day 7-28. Noteworthy changes for both GPx activity and TBARS levels following cadmium exposures were only observed on day 28; increase and decrease respectively. Lead caused a substantial increase in GPx activity from day 14-28 and no significant changes in TBARS levels. Exposure to mercury also caused a considerable increase in GPx activity on day 7 and 21, whilst TBARS levels were significantly lower on day 7 and 14. The results suggest that chronic exposure to heavy metals increases GPx activity, which may be linked to decreased lipid peroxidation, thus demonstrating GPx contribution in protection against peroxidation of lipids.

Keywords: heavy metals, lipid peroxidation, glutathione peroxidase, snails.