

THE USE OF PIG AND CATTLE MANURE AS SOIL FERTILIZERS: AN
ECOTOXICOLOGICAL EVALUATION USING EARTHWORMS *Eisenia andrei*

Eduarda Braga Fernandes¹; Bárbara Estevão Clasen^{1,2}; Edivania Gelati De
Batista¹, Daiane Weiss², Rafael Schroeder Gadini², Jossiele Wesz
Leitemperger², Tamiris Rosso Storck²

¹ Postgraduate Program in Biological Sciences: Toxicological Biochemistry,
Federal University of Santa Maria, ² Postgraduate Program in Environmental
Engineering, Federal University of Santa Maria.

INTRODUCTION: The intense production of cattle and pigs for human consumption has great economic importance, however, it can generate negative environmental impacts due to the incorrect disposal of untreated or inadequately treated waste. **OBJECTIVE:** Therefore, this study aimed to evaluate the effects of exposing earthworms of the species *Eisenia andrei* to swine and cattle waste used as fertilizers in agricultural soils. **MATERIALS AND METHODS:** The organisms were exposed for 28 days to soils containing the following treatments: Control (CT), Cattle Liquid Slurry (DLB), Swine Liquid Slurry (DLS) and Swine Deep Litter (CSS). Subsequently, on the 14th and 28th day of exposure, analyses of antioxidant and neurotoxicity biomarkers were performed, such as: antioxidant capacity against peroxyl radicals (ACAP), glutathione reductase (GR), peroxide, reactive oxygen species (ROS), protein carbonylation, thiobarbituric acid reactive substances (TBARS) and butyrylcholinesterase (BChE). **RESULTS:** During the exposure period (14 and 28 days), it was possible to observe changes in the responses of biochemical biomarkers in *E. andrei*. There was an increase in ROS production in all groups tested compared to the control, as well as an increase in ACAP levels on the 28th day and GR on the 14th day. An increase in protein carbonylation and TBARS was observed in all groups on the 14th day of exposure. There was an increase in BChE enzyme activity in all treatments compared to the control group. **CONCLUSION:** Exposure of *E. andrei* to swine and cattle manure generated oxidative stress and damage, as well as neurotoxic effects. Thus, the application of manure to the soil over time may impact the survival and locomotion of earthworms, thus affecting the biodiversity of the ecosystem as a whole.

Keywords: biomarkers; waste; toxicology

Work supported by the PROEX-CAPES program.