

BEHAVIORAL AND BIOCHEMICAL PARAMETERS IN *Eisenia andrei* ARE ALTERED
BY THE STRUCTURE OF SOIL CONTAMINATED WITH FUNGICIDE

Edivania Gelati de Batista¹; Jeane de Lima Costa Gomes¹; Jaíne Ames¹; Tamiris Rosso Storck¹;
Jossiele Wez Leitemperger¹; Alice Estivalet Visentini¹, Kássia Silveira Crivellaro¹; Estivan Driemeier
Fernandes¹; Bárbara Estevão Clasen¹; Vania Lucia Loro¹

¹Universidade Federal de Santa Maria, Santa Maria, RS, Brazil

INTRODUCTION: Bordeaux mixture is a fungicide that contains copper (Cu^{2+}) and is used extensively in agriculture. The continuous use of fungicides has caused the accumulation of Cu^{2+} in soils, which poses a risk to non-target soil organisms, such as earthworms. Bioassays are performed after the destruction or modification of the in situ characteristics of the soil. Modification in the soil structure alters the retention and mobility of metals. **AIM:** The present study aimed to verify the differences in the toxicological potential of soils contaminated with Cu^{2+} in earthworms (*Eisenia andrei*) through bioassays performed with undisturbed and disturbed soil samples. **MATERIALS AND METHODS:** Soil samples were collected from a vineyard area with a record of application of the Bordeaux mixture in southern Brazil. These soil samples were collected in two different ways and classified as disturbed (previously modified and altered soil samples) and undisturbed (samples with the original characteristics of the field). To evaluate the toxicity of the soil samples on earthworms (*Eisenia andrei*), behavioral assays (avoidance test) were performed, as well as analyses of the biochemical parameters: metallothioneins (MT), carbonyl protein (CP), activities of the enzymes catalase (CAT), glutathione S-transferase (GST) and acetylcholinesterase (AChE). **RESULTS AND CONCLUSION:** The results of the avoidance test indicated that 80% of earthworms avoided copper-contaminated soil in the disturbed soil, while 92% of earthworms avoided copper-contaminated soil in the undisturbed soil samples. Biomarkers showed increased levels of MT, CP, and CAT reduction activity for both soil conditions. GST activity increased only in disturbed soil. The AChE activity showed increased activity only in the undisturbed soil. The results clearly showed some effects of copper toxicity, sometimes related to soil conditions. The relationship between soil condition and copper toxicity remains unclarified.

Keywords: Earthworms; Bordeaux mixture; Toxicological effects.

This work was supported by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Brasil (CAPES – PROEX, process number 88887.920281/2023-00).