TERRESTRIAL ECOTOXICITY EVALUATION OF A SUSTAINABLE FERTILIZER DERIVED FROM PULP AND PAPER RESIDUES

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INTRODUCTION**:** The widespread use of fertilizers in last decades has significantly increased the global food production capacity. However, recently, some studies have pointed out both the inefficiency and the environmental risks associated with conventional fertilizers. In this context, there is an urgent need to develop safer and more sustainable fertilizers such as the Dregs, residues from the pulp and paper industry. OBJECTIVE**:** To assess and compare the terrestrial ecotoxicity of the Dregs and calcitic limestone (a conventional soil corrective) on cucumber seeds (*Cucumis sativus*) and earthworms (*Eisenia andrei*). MATERIALS AND METHODS**:** Elutriates of the Dregs and calcitic limestone at different concentrations (0.01, 0.1, 1.0, 10, 100, and 1000 mg/L) were prepared according to ABNT NBR 15469:2021: 30 min of agitation, 1 h of settling, and an additional 30 min of centrifugation. The phytotoxicity test was performed based on the *Ecological Effects Test Guidelines – Seed Germination/Root Elongation Toxicity Test* (USEPA, 1996). In Petri dishes with filter paper, 10 seeds and 2 mL of each test substance were added for each experimental group (in triplicate) and controls (NC = distilled water; PC = 3.0 mg/mL $ZnSO_4 \bullet 7H_2O$), The plates were incubated for 120 h and then seed germination and root elongation were assessed. The acute toxicity test for earthworms (OECD 207:1984) was also conducted using contact with filter paper. Ten replicates per experimental group and controls (NC = distilled water; PC = 1.8 mg/mL $ZnSO_4 \bullet 7H_2O$) were performed with one earthworm and 2 mL of each test substance. The plates were incubated, and mortality was assessed at 24, 48, and 72 h. RESULTS**:** For the seeds, no significant differences were observed between the tested concentrations of the fertilizer and limestone and their respective NC, both for germination and elongation. Regarding the earthworms, no mortality was observed at any concentration of either test substance. CONCLUSION**:** The Dregs-based fertilizer did not exhibit ecotoxicity for cucumber seeds (*Cucumis sativus*) and earthworms (*Eisenia andrei*). Therefore, our results indicate that the Dregs is a promising sustainable alternative to conventional fertilizers or soil correctives.

Keywords: Dregs; Limestone; Soil corrective; Seeds; Earthworms.

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