

Poster 43

The ecotoxicity evaluation of Gens ponds: are the pH values a confounding factor?

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Abstract

Background: Portuguese polymetallic mining activities were important for local development of economy and ceased in 1970s. However, these activities leave amounts of tailings susceptible to erosion and chemical weathering, representing a potential risk to the environment, due to a high concentration of heavy metals and acidic mine drainages [1,2]. Gens ponds arose due to open pit mining in a gold-antimony mine in Gondomar (north of Portugal). **Objective:** Evaluate the ecotoxicological effect of natural water samples from these ponds in *Lemna minor* (growth inhibition) and *Daphnia magna* (acute immobilization, survival, and feeding rate inhibition assays) along seasons from one year. **Methods:** The assays were performed according to standard guidelines using the natural water samples from each pond (P1, P2, and P3) and the same samples with pH adjustment (BP1, BP2, and BP3) according to the optimal value for the organisms tested. **Results:** *L. minor* showed a significant decrease in fronds number in all samples. However, after pH adjustment, the number of fronds increase significantly in summer samples (BP1 and BP2). *D. magna* exposed to P1 and P2 showed 100% mortality in less than 24 h, while P3 only after 48h was recorded mortality. Overall, BP1, BP2, and BP3 do not affect *D. magna* survival, however, a significant decrease in the feeding rate was observed, in BP1 and BP2 in summer samples. Nevertheless, the winter samples showed an increase in feeding rate after exposure to BP1, BP2, and BP3. **Conclusions:** The results emphasize the importance of conducting ecotoxicological studies in acidic mine drainage, as Gens Ponds, to assess the effects on the ecosystem health. Further studies will be necessary to evaluate the toxicity of these ponds, considering other physical and chemical characteristics (e.g., metals and nutrients), as well as other model organisms and endpoints from different levels of biological organization.

Keywords: acidic mine drainage; ecotoxicology; *Daphnia magna*; *Lemna minor*

Acknowledgments

This work was supported by the strategic programs UIDB/04423/2020 and UIDP/04423/2020. Sara Antunes are hired through the Regulamento do Emprego Científico e Tecnológico—RJEC from the Portuguese Foundation for Science and Technology (FCT) program (CEECIND/01756/2017). Bárbara S. Diogo was supported by a FCT PhD grant (ref. 202210505.BD).

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