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BOOK OF ABSTRACTS



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Study of the efficacy of a bioremediation system treating a contaminated sediment by microalgae ecotoxicity evaluation PC 80

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Abstract

A bioremediation batch test was performed on a sediment sample collected in Bento Rodrigues, after the mining dam failure in Mariana, Brazil. The experiment was carried out in a patented prototype [1] with the application of microbial consortium that includes the fungus *Aspergillus flavus* and *Penicillium spp.* This work intends to evaluate the efficacy of bioremediation by microalgae ecotoxicity evaluation.

Bioremediation experiment was a batch closed system without draining. Besides sediment and inocula, it included the same formulation from a previous study where mangrove oil spill bioremediation was achieved with success: oil, water (sea water) and castor cake (biodiesel production residue). From bioremediation experiment initial sediment and all resulting identifiable products were analyzed corresponding to 4 samples: initial sediment, bioremediate sediment (end of experiment), superficial layer of bioremediate sediment (end of experiment) denominated “crystal” due its characteristics.

For ecotoxicity evaluation microalgae *Pseudokirchneriella subcapitata* was used, and method was adapted from OECD TG 201.

Growth inhibition was determined for each sample and results indicate a significant reduction in the ecotoxicity potential of the sediment. An ecotoxicity abatement of 66%, 41% and 45% was found for each assay, comparing initial sediment with bioremediate sediment, which represents an ecotoxicity average reduction of 51% (STD of 11%). Sample denominated “crystal” on the other end showed an increase in ecotoxicity, which can be due to inhibition to high NaCl content (X-ray results) coming from added sea water, since no metals were found. From ecotoxicity tests, it can be concluded that bioremediation was effective on lowering the ecotoxicity potential of the sediment.

Bibliography

[1] Quintella, C. M., Gonçalves, O. (2012). Brazilian Patent no. PI 10 2012 033531 0.