

Cd Immobilization in Horton Plains Using Natural Bio Char Generated from the Same Eco-System

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Horton Plains is one of the most important natural resources in Sri Lanka which has been threatened by a large-scale forest dieback. A previous study revealed that isolated soil Cd as one of the key causes behind forest dieback in Horton Plains. The extraordinary capabilities of biochar in detoxifying both organic and inorganic contaminants have been well recognized and it is vital to develop an effectual and cost effective method using biochar would be an applicable remedial measure. Biochar has the ability to immobilize heavy metals from contaminated soil due to its' chemical composition. The pH and the CEC of the forest soil used for the study were 5.4 and 210 c mols kg⁻¹ respectively. The soil was rich with organic matter and the content of soil organic matter (SOM) has reached up to 13.4%. Bio char which was prepared under controlled conditions using the wood collected from Horton Plains was used as the soil treatment and along with the control the study consisted of two treatments of five replicates. Ten soil samples which contained 25 g were acquired from bulked soil and five of them were treated from 5 g of biochar available in Horton plains and every single soil sample was spiked with 20 ml of 500 ppm Cd solution. Treatments were added to the soil samples and the available Cd was extracted using standard methods in literature, and the Cd concentrations were analyzed using the Atomic Absorption Spectrophotometer (AAS). Immobilization of Cd in the soil samples treated with biochar naturally available in Horton plains was significant ($P < 0.03$) and the rate of the reduction of the available Cd in the soil was drastic. However, the control has also shown its capacity to immobilize soil Cd because of the existence of extraordinary level of SOM and active natural sorbents presence in SOM such as humic and fulvic acids.

Keywords: *Horton Plains, Forest dieback, Soil remediation, Cadmium immobilization, Bio char*