

DIEBACK OF NAA TREE (*Mesua ferrea*) RAJAWAKA NATURAL FOREST, IN SRI LANKA: IS SOIL CADMIUM THE CAUSE?

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It appears that the forest dieback has spread across Sri Lanka and entered in to Rajawaka natural forest as well destroying some tree species such as Naa and *Syzygium*. Also, 80% of the dead “Naa” (*Mesua ferrea*) trees were relatively large with 1.50–2.50 m in Girth at Breast Height (GBH). This research has focused on identifying a link between soil pollution with Cadmium (Cd) and forest dieback. Additionally, this study has attempted to understand the efficacy of Pinus wood biochar in neutralizing soil Cd. Soil samples, at 0.10–0.12 m depth, were collected 0.50 m away from eight-dieback affected and eight healthy Naa trees for the laboratory trail. The general soil characteristics analysed included soil texture, pH, Electrical Conductivity (EC), Soil Organic Matter (SOM) and soil microbial diversity. Additionally, the available soil Cd was also analysed. Effectiveness of Pinus wood biochar in neutralizing available Cd in the soil was assessed using Cd-spiked soil samples treated with powdered Pinus biochar. These samples were left for incubation at room temperature for ten days. Available Cd concentrations were analysed using the Atomic Absorption Spectrophotometer (AAS). Soil pH of healthy and dead soils were 4.11 and 4.31 respectively. The EC of healthy and dead soils were 0.50 S/m and 1.22 S/m respectively. SOM content of healthy and dead soils were 9.32% and 8.69% respectively. The average microbial colony count of healthy soil was higher than the soils collected near dead trees. According to results available soil Cd was significantly different between Healthy tree soil samples and die back affected Naa tree soil samples it revealed that cadmium can be caused to die back of Naa trees and according to the experiment influence of Pinus biochar on detoxifying soil Cd result was significant. It suggested that Pinus biochar can be use as solution to the problem.

Keywords: Bio char, Cadmium, Forest dieback, Immobilization, Rajawaka forest