

## Does low arbuscular mycorrhizal fungal colonization potential in plant roots result forest dieback at Horton plains national park?

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Horton Plains National Park (HPNP) is a plateau at the southern edge of the main Sri Lanka's central mountain massif. One of the most striking observations that anybody could make during a visit to Horton Plains is the dying trees at an alarming rate, forest dieback. Although there are many researches done on forest dieback in the montane forest, of Horton Plains, none have been able to identify the major cause for the problem and very little work has been done on the role of arbuscular mycorrhizae on forest dieback. Twenty four permanent plots of 20 m x 20 m were established randomly to cover 41-60% tree dieback area at Horton Plains National Park. Five randomly selected *Syzygium rotundifolium* saplings were taken as test plants. Four treatments were set up as control, addition of compost, compost with native mycorrhizae isolated from Horton Plains and native mycorrhizae only. In general, arbuscular mycorrhizal colonization is rather low in the present study sites of Horton Plains, when compared with that of similar regional ecosystems studied so far. Although tropical

forests support a high diversity of plants, at Horton Plains their associated arbuscular mycorrhizal fungi (AMF) are not diversified, possibly because AMF network might be disturbed or poorly established. Soil analysis showed a relatively low fungal spore count compared to other studies done in similar ecosystems. Soil pH, soil organic matter content and total nitrogen showed non significant differences between treatments. However, total phosphorus content significantly increased in plots with mycorrhizal addition than in the control plots. Soil pollution with Pb and Cd is evident at Horton Plains. In the present study, it is not surprising that lower AMF colonization correlated with poor AMF soil inoculum potential at Horton Plains. However, present study suggested that we could improve AMF colonization in soil through external addition of native AMF to the soil, thereby restoring the vigor of this vulnerable forest back to its initial glory.

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