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**Relationship between Tree Girth and Forest Dieback Severity in Horton Plains National Park, Sri Lanka**

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**Abstract**

Forest dieback changes the physiognomy, structure and floristic composition of montane forests leading to deterioration of ecosystem services. Although research has been conducted to investigate the etiology of forest dieback at Horton Plains National Park (HPNP), a direct cause for this phenomenon is yet to be identified. We investigated the relationship of plant maturity with forest dieback in montane forest species at HPNP. Two sites were selected considering the dieback percentages: less than 25% crown dieback as the healthy site and more than 75% crown dieback as the severe forest dieback site. The percentage crown dieback and girth at breast height was recorded in all individuals >10 cm in both plots. The mean GBH varied significantly among different crown dieback categories in five tree species in the healthy site and four tree species in the severe forest dieback site. In the healthy site, the mean GBH of healthy *Cinnamomum ovalifolium* trees was lower than that of dead trees while in the severe dieback site, it was higher for the severe crown dieback category than the healthy and rare dieback categories. In the severe dieback site, the mean GBH of healthy *Symplocos obtusa* trees was lower than that of the medium crown dieback category, while the mean GBH of dead *Eurya chinensis* trees was higher than that of healthy and rare crown dieback categories, in the severe dieback site. Furthermore, low crown dieback percentages were recorded in *Syzygium rotundifolium*, *Vaccinium leschenaulti*, and *Litsea ovalifolia* with the low mean GBH. A lower mean GBH was recorded for dead individuals of *Symplocos cordifolia* than healthy individuals. More research must be conducted to understand the relationships between forest dieback and site-specific factors to ensure the success of conservation efforts in tropical montane forests at HPNP.

**Keywords:** Forest dieback, GBH, Plant maturity, Tropical montane forests