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Study of Topographic Variation in Leaf Traits of Selected Canopy and Sub Canopy Tree species in the Sinharaja Tropical Rain Forest

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Abstract

Sinharaja tropical rainforest is one of the most important ecosystems in the country and records a high number of endemic plant species. The objective of the study was to identify the variations in leaf morphological characteristics of canopy and sub canopy trees with the changes in topography. For the study six endemic species were selected with three species each representing the canopy and sub canopy groups. The leaves of fully matured trees were studied from two topographic positions representing the ridge and valley. Morphological characteristics compared include both measured parameters (leaf length, width, leaf area, fresh weight and dry weight) and derived parameters (moisture content, specific leaf area (SLA) and leaf dry matter content (LDMC)).

When the cumulative mean values of the leaves for the two topographic locations are compared, the valley has higher leaf length, width, area, fresh weight, dry weight and SLA values. The LDMC and moisture content mean values are comparatively similar in both ridge and valley. However when individual species are compared between the two locations, some show the opposite trend to that of the mean values.

Among the canopy trees, *Anisophyllea cinnamomoides* shows a significant difference ($p < 0.05$) between ridge and valley in all parameters except SLA. It also shows the highest LDMC percentage among all six species at 56.72 percent in the ridge. *Bhesa ceylanica* shows a significant variation in all traits barring SLA and leaf length. *B. ceylanica* also has the highest mean values for length, width, area, fresh weight and dry weight among the six species. *Palaquium petiolare* shows significant variation between in only three parameters which are length, moisture content and LDMC. The three sub canopy species show lower differences in traits between the two locations. Among them *Cullenia ceylanica* shows a significant difference in both fresh and dry weight, moisture content and SLA. *Garcinia echinocarpa* shows a significant difference only among leaf length and SLA, with its ridge SLA mean of $5.6 \text{ mm}^2\text{mg}^{-1}$, being highest among all 6 species. *Chaeocarpus castanocarpus* shows the most difference among sub-canopy species with only length and width not showing a significant difference.

Keywords: Sinharaja, Tropical Rain Forest, Leaf Morphology, Topography, Canopy Sub Canopy species, Ridge and valley