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Leaf anatomy of some canopy, sub canopy and understorey seedlings grown under different light regimes in the Sinharaja forest

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Light is especially crucial during the seedling stage of rain forest trees. Therefore, it is necessary to know the nature of the responses of the seedlings in different light environments in order to carry out most of the silvicultural practices in forest management. The anatomical characteristics at leaf level are important in the silvicultural practices since these characteristics play a major role in reducing water loss and increasing photosynthesis. In this regard, study of the leaf structure of endemic tree species in most abundant light environments in the lowland rain forests is very important.

This study examined the anatomy of some seedling leaves belonging to canopy, sub canopy and understorey species which have been grown in controlled light environments for two years near the field station of Sinharaja forest reserve. There were seventeen species. (10 canopy, 4 sub canopy and 3 understorey species) belonging to families; Diptercarpaceae, Clusiaceae and Melastomataceae. The controlled light environments were having the light environments of partial sun (R: FR ratio 1.05, PPFD 800 $\mu molm^{-2}s^{-1}$) and partial shade (R: FR ratio 0.97, PPFD 350 $\mu molm^{-2}s^{-1}$). Each light level had three replicate shade houses. The leaf anatomy attributes considered were: thickness of leaf blade, upper epidermis, palisade mesophyll, lower epidermis and cuticle layer.

Results showed significant difference of the leaf anatomical attributes in most of the species in two light environments. Within canopy species, except for *Shorea trapezifolia and S. congestiflora,* in other 8 canopy species, considered leaf anatomical attributes have increased in partial sun. For all sub canopy and understorey species, all considered anatomical attributes have increased with light intensity, although there were no significant difference of some of the attributes in two light environments. Results elucidate that the considered anatomical attributes can be used in determining the shade tolerance of a species. Most of the species show better performance in partial sun.

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