

THE VARIATION IN LEAF STRUCTURE OF SEEDLINGS IN THE FAMILIES DIPTEROCARPACEAE, CLUSIACEAE, AND MYRTACEAE UNDER DIFFERENT LIGHT ENVIRONMENTS

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Light has been characterised as the most important environmental factor that affect the leaf structure of tree seedlings in tropical rain forest in South and Southeast Asia. Many studies have been carried out on leaf structure of early-successional and late-successional species and also among the species within the same successional status. These studies have helped in creating a clear understanding of ecological distribution in relation to each species. The present study examined the leaf structure of six canopy tree species that are considered to be relatively shade tolerant in lowland rain forests in Sri Lanka.

Seedlings of *Dipterocarpus zeylanicus*, *D. hispidus* (Dipterocarpaceae), *Mesua ferrea*, *M. nagassarium* (Clusiaceae), *Syzygium firmum* and *S. rubicundum* (Myrtaceae) were grown in different controlled environmental shelters that simulated a range of light environments found in the ground storey of the rain forest. Two treatments exposed seedlings to different duration of full sunlight. These simulated the groundstorey Photosynthetic Photon Flux Density (PPFD) that were comparable to the centres of about 200 m² and 400 m² canopy openings. Three other shelters exposed seedlings to uniform diffuse light conditions that simulated amounts and qualities of radiation similar to that of the forest understory (PPFD 50, R:FR ratio 0.46; PPFD 350, R:FR ratio 0.97; PPFD 800, R:FR ratio 1.05). A control light treatment proved full sun light quality (PPFD 2000, R:FR ratio 1.27) for the seedling growth.

The attributes measured were thickness of leaf blade, upper and lower epidermis, palisade mesophyll and number of layers, and stomatal frequency. Results show that *Syzygium* species have highest in leaf blade, palisade cell thickness and stomatal frequency followed in order by *Mesua*>*Dipterocarpus*. This suggests that *Syzygium* species are more light tolerant but less in drought tolerance. The thickest upper and lower epidermis in *Dipterocarpus* reveal that they are more efficient in water use. *Syzygium* and *Dipterocarpus* exhibit rows in palisade mesophyll when exposed to full sun. These findings elucidate some of the relationships between leaf anatomy and the species ecology across the forest topography.