

## **Foliar plasticity of two *Shorea* species in relation to crown position under different light conditions in the *Pinus caribaea* buffer zone of the Sinharaja MAB Reserve**

Plants show plastic responses within the crown along the vertical gradient (upper, middle, lower) in response to changing environmental conditions. This study examined the foliar responses exhibited by *Shorea megistophylla* and *Shorea disticha* in relation to crown position under four different light treatments in the *Pinus caribaea* buffer zone of the Sinharaja MAB reserve. Both species were grown in four light treatments (gaps) created by removing rows of Pine trees. Light intensity at the top, middle and bottom canopy positions were measured to determine its variation within and among the canopy removal treatments. Different morphological (petiole length and diameter, drip tip length and leaf area) and ecophysiological parameters (thicknesses of the leaf blade, upper and lower epidermis, cuticle and palisade layer; stomatal index; dry weight; saturated fresh weight and chlorophyll content) were measured in leaves located in the three crown positions of the four light treatments (gaps) to emphasize the relationship between light and foliar responses of the two *Shorea* species.

The light intensity varied significantly with the crown position. It was found that leaves from the upper crown position were adapted to reduce stress from high intensity of incident light, whereas those at the lower canopy level were adapted to capture the maximum amount of sunlight, available. In general, leaves from the upper crown position showed morphological and ecophysiological responses normally associated with "sun leaves" (such as small leaf area, increased blade and palisade layer thickness, reduced stomatal index and low chlorophyll content) while lower canopy level leaves showed responses associated with "shade leaves". The foliar plasticity of both species was not significantly different in some of the canopy removal treatments. Significant foliar plasticity was observed in *S. megistophylla* in the three Pine rows removed (3R) treatment and in *S. disticha* in the one Pine row removed (1R) and three Pine rows under planting (3U) treatments. The results of this study demonstrate the linear leaf adaptations of *S. megistophylla* and *S. disticha* in response to changing light intensities at different canopy levels.