

## Effect of light regime on the growth and biomass allocation of canopy and understorey species in a lowland rain forest, Southwest, Sri Lanka

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An experiment was conducted to investigate the influence of light on seedling growth and biomass allocation of three canopy species; *Myristica dactyloides*, *Artocarpus nobilis*, and *Litsea gardneri* and seven understorey species: *Agrostistachys hookeri*, *Diospyros insignis*, *Litsea longifolia*, *Stemmenoporus canaliculatus*, *Timonius jambosella*, *Symplocos pulchra* and *Nargedia macrocarpa* in lowland tropical rain forest, southwest Sri Lanka. Eight species are endemic to Sri Lanka. Seedlings were grown in shade houses that provide full sun ( $1200 \mu\text{mol m}^{-2} \text{s}^{-1}$ ), light shade ( $800 \mu\text{mol m}^{-2} \text{s}^{-1}$ ), medium shade ( $350 \mu\text{mol m}^{-2} \text{s}^{-1}$ ), and deep shade ( $50 \mu\text{mol m}^{-2} \text{s}^{-1}$ ). Seedling height and mortality were recorded in three month intervals. Digital photos of leaves were taken for leaf area measurements. After two years of growth, seedlings were uprooted and dried at  $80^\circ\text{C}$  and dry mass recorded for root, stem and leaves. Mass ratios (Mass of plant part divided by total mass) were calculated for leaves (LMR), roots (RMR), and stem (SMR). Growth in height of both canopy and understorey species were greatly increased in response from deep shade to medium shade and decreased light shade to full sun. Seedling mortality of canopy species were not significantly affected by irradiance level except for *Litsea longifolia*. Survival of understorey species highly reduced in full sun than other shade treatments. Total dry mass allocation for both canopy and understorey species were the lowest in deep shade. Canopy species showed greatest total dry mass allocation for medium shade light treatment. There was no significant difference between other three shade treatments for understorey species. In deep shade, both canopy and understorey species exhibited the highest LMR. SMR of canopy and understorey species did not show significant difference between shade treatments. High RMR was recorded in the full sun and light shade treatment for canopy species and in light shade for understorey species. The results of the experiment indicated that growth of canopy species are more plastic than that of understorey species in response to changes in irradiance.