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Stomatal characteristics and their plasticity of some rain forest tree species in simulated light environments

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Plasticity of stomatal characteristics of leaves belonging to five rain forest tree species were considered in this study. The species were *Campnosperma zeylanicum* (Aridda) (Anacardiaceae), a canopy tree species; *Hopea discolor* (Peely-dun) (Dipterocarpaceae), *Aporusa cardiosperma* (Kampotta) (Euphorbiaceae), which were subcanopy tree species; *Lijndenia capitellata* (Pini-baru) (Melastomataceae) and *Xylopia championii* (Athu-ketiya) (Annonaceae) that were understory tree species exposed to four light environments under simulated different photosynthetic photon flux densities (PPFD) and spectral qualities (red to far-red, R:FR) found in the ground storey of the Sinharaja Rain Forest. These tree seedlings have been grown under the specified light environments for two years. At the end of two years, leaf epidermal impressions were taken and stomatal density and the length of stomatal aperture were determined.

The study revealed that there was a significant difference among light environments for stomatal density of all species. For stomatal aperture length, except for *Hopea discolor* and *Lijndenia capitellata,* all other species showed a significant difference. However, in all species these two attributes increased with the increasing irradiance level. In addition, comparing the crown positions of these species, both stomatal density and aperture length in canopy, subcanopy and understory strata showed a significant difference among strata in the four light environments. Understory tree species have the highest stomatal density in all light environments and sub canopy species have the lowest. But the stomatal aperture length was highest in sub canopy species. Plasticity was highest for stomatal density in *Hopea discolor,* whereas it was lowest in *Aporusa cardiosperma.* For stomatal aperture length, highest plasticity was recorded in *Aporusa cardiosperma* and lowest was in *Hopea discolor.* These findings elucidate that the considered stomatal characteristics have a positive relationship with the light environment.