

Effect of different shade periods on *Neobalanocarpus heimii* seedlings biomass and leaf morphology

ABSTRACT

Neobalanocarpus heimii, a well-known heavy hardwood timber species, is categorised as Vulnerable in Peninsular Malaysia due to the extreme demand for its timber and poor regeneration of the species. Moreover, limited research on shading and its effect on biomass allocation, biomass ratio and leaf morphology pose great challenge for *N. heimii* restoration. A study was carried out to elucidate the effects of four shade periods on biomass allocation, biomass ratio and leaf morphology of *N. heimii* seedlings, namely 0, 6, 9 and 12 months under shade. Mass of stem, leaf, root and total plant were significantly reduced when the seedlings were grown under full sunlight for 12 months. Under reduced shade period, leaf mass ratio decreased, while root mass ratio and root to shoot mass ratio increased. Morphological properties of the leaf were significantly affected by various shade periods, where leaf area and leaf area ratio values were reduced by removing shade at different periods. Results indicated that *N. heimii* seedlings could acclimatise to direct sunlight particularly after they had been placed under the shade for 6 to 9 months.

Keyword: Dipterocarpaceae; Acclimation; Biomass allocation; Leaf area; Specific leaf area; Leaf area ratio