

SHADE, SEED MASS, AND EARLY SEEDLING DEVELOPMENT OF SELECTED *Dipterocarpaceae* SPECIES OF SRI LANKA

I.M.S.S. Karunarathne¹, H. Jayasinghe², S.A. Perera³, M.M.G.I.N.M.B.
Madawala³, K.T. Weeraratna¹, N.K. Fernando¹ and N. Geekiyanage¹

¹*Department of Plant Sciences, Faculty of Agriculture, Rajarata University of Sri Lanka, Anuradhapura, Sri Lanka.*

²*Plant Taxonomy and Conservation, National Institute of Fundamental Studies, Kandy, Sri Lanka.*

³*Endane Field Research Station, Dilmah Conservation, Dilmah Ceylon Tea (Pvt) Ltd, Nivithigala, Sri Lanka.*

The Dipterocarpaceae family is a key component of tropical rainforests, including the Sinharaja forest. The effects of light conditions (60%, 70%, and 80%) on seed germination and early seedling development in 10 threatened *Dipterocarpaceae* species were investigated. Seeds were collected from various locations within Sinharaja Forest. A total of 135 mature seeds per species were germinated under the 60%, 70%, and 80% shade treatments in a randomized complete block design with three replicates per treatment. Seedling traits: germination, number of leaves, basal diameter, leaf area, and leaf thickness, were recorded fortnightly. Seed traits such as length, width, dry mass, and seed coat ratio were also measured. Data were analyzed using linear mixed-effects models with *post-hoc* comparison of means with Tukey's test. Linear regression analysis revealed that seed dry mass significantly influenced height growth rate under 80% ($p=0.0309$) and 70% ($p=0.025$) shade conditions, while the effect was marginally significant under 60% shade ($p=0.058$). Additionally, seed dry mass was significantly related to the diameter growth rate under 80% shade ($p=0.027$), but no significant effects were observed under 60% ($p=0.149$) and 70% ($p=0.131$) shade conditions. The comparison of germination rates across the three shade levels showed a significant effect of shade on germination rate ($p=0.042$), indicating that different shade levels influence germination. However, no significant differences were found among shade levels for diameter growth rate ($p=0.851$) and height growth rate ($p=0.329$). These findings suggest shade significantly influences seedling germination, particularly under higher shade levels, but do not uniformly affect all growth parameters. Findings provide insights into the role of shade in influencing early stages of Dipterocarpaceae species supporting conservation and restoration strategies.

Keywords: Conservation, Ecological restoration, Seed traits, Tropical rainforests