

Ectomycorrhizal colonization and seedling growth of *Shorea* (Dipterocarpaceae) species in simulated shade environments of a Sri Lankan rain forest

M.M.D. Tennakoon^a, I.A.U.N. Gunatilleke^a, K.M. Hafeel^b, G. Seneviratne^c,
C.V.S. Gunatilleke^a, P.M.S. Ashton^{d,*}

^aDepartment of Botany, University of Peradeniya, Peradeniya, Sri Lanka

^bSchool of Earth and Geographical Sciences (Soil Science), University of Western Australia, WA 6009, Australia

^cInstitute of Fundamental Studies, Kandy, Sri Lanka

^dSchool of Forestry and Environmental Studies, Yale University, New Haven, CT 06511-2189, USA

Received 18 August 2004; received in revised form 8 December 2004; accepted 29 December 2004

Abstract

The purpose of our study was to examine whether the degree of ectomycorrhizal (EM) colonization was associated with amount of shade for potted seedlings of five rain forest tree species. Seedlings were exposed to a range of shade treatments—from the open to that emulating the degree of shade beneath a deep-canopied forest. The experiment was carried out at the field station (580 m.a.s.l) of the Sinharaja World Heritage Site in southwestern Sri Lanka. We selected five species for the study: *Shorea affinis* (Thw.) Ashton, *S. congestiflora* (Thw.) Ashton, *S. cordifolia* (Thw.) Ashton, *S. gardneri* (Thw.) Ashton, and *S. zeylanica* (Thw.) Ashton, all members of a sympatric clade of endemic canopy trees in the family dipterocarpaceae. Results show that the percentage EM colonization was significantly different among shade treatments, for all five species ($p < 0.05$). However, EM root colonization was not significantly different among species. Highest percentages of EM colonization for all species, except for *S. congestiflora*, were in treatments providing full open conditions. However, seedling growth of all species were best under partial shade conditions ($p < 0.05$), intermediate between the deep shade of a forest understory and no shade of open environments. The non-linear relationship between seedling growth performance and EM colonization is discussed.

© 2004 Elsevier B.V. All rights reserved.