Effect of Biofilm Biofertilizer on the Performances of Native Plant Species in degraded grasslands at Knuckles Forest Reserve, Sri Lanka

R. D. A. Gunasekara [1]*, G. Senevirathne[2], I. A. U. N. Gunatilleke[3], C. V. S. Gunatilleke[4] and A. M. T. A. Gunaratne[5]

*[1]Postgraduate Institute of Science, University of Peradeniya, Sri Lanka
[2]Institute of Fundamental Science, Kandy, Sri Lanka
[3,4,5] Department of Botany, Faculty of Science, University of Peradeniya, Sri Lanka

Abstract

Lower montane forest in "Knuckles Forest Reserve" is important due to harbouring of high biodiversity and provision of watershed services to Sri Lanka. In the British colonial era, these forests were cleared for coffee and tea plantations. However, some of these lands were abandoned due to low yield. Presently, these abandoned lands are dominated with *Cymbopogon nardus* and they act as a barrier for reconnecting the fragmented forest patches. Therefore, this study aims to restore lower montane forests on these grasslands by planting native plants in islands and with the application of biofilm biofertilizer (BFBF). Rhizosphere microorganisms were isolated from the seedlings of *Macaranga indica*, *Bhesa ceylanica*, *Symplocos cochinchinensis* and *Eugenia bracteate*. Among the isolates three different combinations of fungal and bacterial mixtures were selected as BFBF. A field study was conducted in four grassland blocks of three plot sizes (small 4 m^2, medium 16 m^2 and large 64 m^2). Seedlings of above four species were planted randomly at 1 m interval in the plots. Half of each plot was treated with BFBF and the other half was kept as a control. Number of survived species and their heights were recorded every month. Significantly higher Relative Growth Rate (RGR) of the four species was recorded in the plots applied with BFBF. *M. indica* and *S. cochinchinensis* showed the highest RGR and the survival in all the plots. *Eugenia bracteata* observed the lowest survival. This research indicates the potential use of BFBF in degraded grasslands for ecological restoration programs.

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Corresponding Author: rda@bot.ruh.ac.lk