

Biomass and Carbon Sequestration of Forest Tree Species in Response to Microbial Biofertilizers

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Climate change is presently the most important issue facing our generation. Estimation of plant biomass is one of the methods used to determine the amount of stored carbon, which can help implement appropriate strategies to reduce environmental degradation and mitigate climate change. This study assessed the carbon sequestration and storage by three reforestation species: *Pterocarpus indicus*, *Acacia mangium*, and *Eucalyptus urophylla*, as influenced by microbial fungi with or without nitrogen fixing bacteria (NFB). *Pterocarpus indicus* were grown in a nursery in Gasan, Marinduque for 5 months, while *A. mangium* and *E. urophylla* were raised at the screen house of BIOTECH UPLB. Inoculation was done during pricking while lime and vermicompost were applied to all seedlings during field planting. Allometric equation developed by Martines-Yrizar et al. (1992) was used to determine biomass density using stem diameter and total height of the tree. Representative trees were excavated 27 months after field planting. Results showed that *A. mangium* and *P. indicus* inoculated with mycorrhiza + NFB showed a 128% and 17%, respectively, increase in accumulated biomass and CO₂ content. In *E. urophylla*, 83% biomass increase was observed with mycorrhizal inoculation alone. The results suggest that plant biomass and carbon sequestration due to microbial inoculation vary depending on tree species. *A. mangium* produced higher plant biomass, that consequently, gave higher amount of stored or sequestered CO₂ than *E. urophylla* and *P. indicus*. Similar studies should be conducted in other mined- out areas in the country to validate the results.

Keyword: *Acacia mangium*, *Eucalyptus urophylla*, mycorrhizal fungi, nitrogen fixing bacteria, *Pterocarpus indicus*