ABSTRACT

Problem statement: Forest rehabilitation with human assistance by species selection and management shortens the time needed to rehabilitate degraded land as compared to natural succession. Empirical data on litter nutrient contents of tropical rain forests in Southeast Asia have been established, however it is limited to rehabilitated degraded lands. The objective of this study was to determine contents of carbon and selected macronutrients of nutrients present in the litter layer of different age stands and an adjacent secondary forest at Bintulu, Sarawak, Malaysia. Approach: Forest litter was sampled in 1 m² quadrates of 5 points in research plots of 20×20 m by carefully brushing off the standing litter layer on the forest floor followed by oven-drying and grinding before analysis using standard procedures for pH, carbon, nitrogen, phosphorus, potassium, calcium and magnesium. Results: Results showed that litter layer was acidic, with pH ranging from 4.4-5.1 in water and 3.7-4.4 in 1 M KCl. Carbon constituted the highest amount of element in litter, ranging from 285.6-363.9 g kg⁻¹ followed by N with a range of 4.4-10.5 g kg⁻¹, followed by P, ranging from 0.05-0.20 g kg⁻¹. Content of K was in a range of 0.91-3.1 g kg⁻¹, while Ca and Mg contents were 0.3-7.9 and 0.39-1.64 g kg⁻¹ respectively. Litter layer mass and content of nutrients increased with stand age. Plots 1993, SF, 1999 and 1991 were clustered together while Plots 2002, 1996, 2005 and 2008 were in the other cluster. Stocks of nutrients in the plots were found to be in the order of C>N>Ca>K>Mg>P. Conclusion: The results are consistent with other secondary and primary forests in the tropics, suggesting that the project is successful in rehabilitating degraded forests in terms of restoring nutrient availability in forest litter.

Keyword: Litter quality; Macronutrients; Secondary forest; Rehabilitated forest.