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COMMUNITY STRUCTURE, ENDEMISM AND EDAPHIC RELATIONSHIP OF TREE COMMUNITIES AT SELECTED FOREST RESERVES IN SELANGOR, MALAYSIA

HASYA HANNANI BINTI RUZIMAN

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

Name of Student   :   Hasya Hannani binti Ruziman

Student I.D. No.   :   2018649692

Programme   :   Master of Science (Biology) – AS750

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Signature of Student   :   …………*Hannani*……………..

Date   :   October 2021

ABSTRACT

Forested areas in Kota Damansara, Ulu Gombak and Bukit Tarek have been gazetted as Permanent Reserved Forest (PRF) under the National Forestry Act 1984 for the purpose of sustainable forest management practices that offer economic, social, and environmental benefits. However, forest degradation and over-exploitation are threatening the biodiversity and ecological services provided by these forests. As a conservation measure, a study was conducted to quantify the community structure, endemism, and edaphic relationship of tree communities at selected forest reserves in Selangor. Tree inventory and soil sampling were carried out in Kota Damansara Forest Reserve (KDFR), Ulu Gombak Forest Reserve (UGFR) and Bukit Tarek Forest Reserve (BTFR). Sampling plot size 0.5 ha was established in each study site covering a total area of 1.48 ha. All trees with diameter at breast height (DBH) of 5 cm and above were measured, tagged, and identified. Topsoil samples with depth ranges 0-15 cm were collected from all the sampling plots for the analysis of texture, pH, cation exchange capacity, available nutrients including N, P, K. The significant differences of species diversity and soil parameters between study sites were tested using one-way analysis of variance (ANOVA). The floristic composition of trees at KDFR consisted of 22 families, 35 genera and 46 species; UGFR contained 27 families, 47 genera and 52 species; meanwhile BTFR showed floristic composition of trees belonging to 32 families, 50 genera and 59 species. Dipterocarpaceae was the most speciose family with nine species at KDFR, while Euphorbiaceae recorded 10 species and eight species at UGFR and BTFR, respectively. Euphorbiaceae also contributed the highest density in study plot at KDFR (54 trees/ha) and UGFR (52 trees/ha) while BTFR was dominated by Myristicaceae (61 trees/ha). The total basal area (BA) of trees at KDFR of 32.97 m^2/ha, UGFR and BTFR indicated total BA of 18.52 m^2/ha and 19.19 m^2/ha, respectively. The highest Important Value Index (IVi) at family level for KDFR was Dipterocarpaceae at 12.72%. Euphorbiaceae showed the highest IVi for UGFR at 15.57% while Myristicaceae with the highest IVi of 9.89% at BTFR. UGFR was found to be the most diverse with Shannon-Weiner Diversity Index of 3.50 (H'max= 3.95) followed by KDFR with 3.43 (H'max= 4.08) and 3.39 (H'max= 3.83) for BTFR. The study sites harbour two endemic species (*Shorea curtisii* and *Madhuca selangorica*) and six endangered species from Dipterocarpaceae that are categorized in IUCN Red List. Soil analyses indicated soil textures in KDFR and UGFR were dominated by sandy clay and sandy loam respectively, meanwhile the soil at BTFR was loam texture. Based on ANOVA, the mean percentage of organic matter were significantly different ($p<0.05$) at the three forest reserves while the soil chemical properties were also significantly different ($p<0.05$) except for available phosphorus and total nitrogen. The ordination diagram constructed using Detrended Correspondence Analysis demonstrated floristic variation of tree communities between the forest reserves due to the environmental gradients. In fact, Canonical Correspondence Analysis biplot revealed a strong influence of the soil factors could be observed for each plot, whereby the tree species composition of plots at KDFR were mainly associated by total nitrogen, whilst plots at UGFR were associated with soil pH and available potassium and plots at BTFR were correlated with soil organic matter, available Mg and cation exchange capacity. Overall, the study indicates the important role of soil factors in influencing the distribution pattern of tree species, therefore a comprehensive management and conservation action plan can be carried out to maintain sustainability of the forest for future generations.

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