

TREE DIVERSITY AND COMPOSITION IN AN AREA BETWEEN UPPER HILL DIPTEROCARP FOREST AND LOWER MONTANE FOREST OF, JERAI FOREST RESERVE

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By

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A Project Report Submitted in Partial Fulfilment of the Requirements for the

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DEDICATION

For my beloved family:

Mohd Ariff Bin Che Mamat

Nahariah Ibrahim

My siblings.

My supervisor

Associate Professor Dr. Mohd Nazre Saleh

To all my best friends,

My team during data collection at Jerai FR.

My final year project's partner.

Thank you for your encouragements supports

And the sacrifices that you have given.

Thank you for everything. May Allah bless all of us.

ABSTRACT

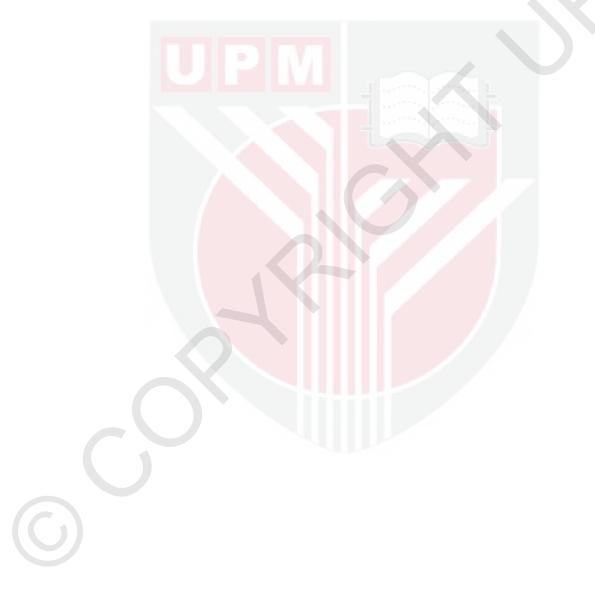
The present study was conducted in an area located between a lower montane forest and upper hill dipterocarp forest at Jerai Forest Reserve, Kedah, Peninsular Malaysia. The purpose of the study was to determine the tree species composition, distribution, richness and diversity in this unique habitat by setting up one hectare plot. The unique structure of mixed forest between upper hill dipteropcarp forest with lower montane possessing numbers of admixture species. A total of 701 individuals belonging to 74 species, 61 genera and 41 families with diameter of 10cm and above were enumerated and identified. Importance value index (IVI) was calculated to show dominant species and the stand density also estimated. The highest IVI was recorded from family of Anacardiaceae with a total value of IVI 21.65%. Family Myrtaceae contributed the highest in stand density with a total of 125 individuals per hectare. Most of the species in Jerai FR stand dominated with the DBH classes of between 10cm to 24.9cm, a common size of trees in higher elevation forest. Shannon's index of diversity in Jerai FR gave a value of 3.68 indicating high diversity in Jerai FR. Tree composition at Jerai FR Is dominated by Myrtaceae with a total of 7 species from 2 genera. This is commonly seen for upper hill dipterocarp forest to lower montane forest in Malaysia with common genera such Syzygium and Tristaniopsis. At elevation of about 1000 to 1200m a.s.l (lower montane forest), the domination of dipterocarp species ends and replaced by species of oak (Quercus and Lithocarpus spp.) and chestnut (Castanopsis). Other genera that are also prominent in the study area include include Agathis, Dacrydium, Baeckea, Leptrospermum and Podocarpus.

ABSTRAK

Kajian ini telah dijalankan di kawasan berhutan jenis bukit dipterokarpa atas dan hutan pergunungan bawah teretak di Hutan Simpan (HS) Jerai, Kedah, Semenanjung Malaysia. Tujuan kajian ini adalah untuk menentukan komposisi, kekayaan dan kepelbagaian spesies pokok di dalam plot bersaiz 1 hektar. Struktur hutan campuran menunjukkan bilangan spesies campuran yang unik dalam habitat ini. Sejumlah 701 individu yang terdiri daripada 74 spesies, 61 genus dan 41 famili pokok berdiameter 10cm dan keatas direkodkan. Indeks nilai penting (IVI) yang dikira menunjukkan nilai IVI tertinggi dari famili Anacardiaceae dengan IVI tertinggi dicatatkan dari keluarga Anacardiaceae dengan jumlah IVI 21.65%. Famili Myrtaceae menyumbang kepadatan ketinggian tertinggi dengan sejumlah 125 individu direkodkan dalam satu hektar kawasan. Kebanyakan spesies pokok di HS Jerai mempunyai kelas DBH di antara 10cm hingga 24.9cm. Ini adalah dijangkakan kerana saiz pokok sebegini adalah biasa di habitat pergunungan. Indeks kepelbagaian Shannon di HS Jerai memberikan nilai 3.68 yang menunjukkan kawasan hutan mempunyai kepelbagaian yang tinggi. Komposisi pokok di HS Jerai didominasi oleh famili Myrtaceae dengan sejumlah 7 spesies dari 2 genus. Hutan dipterokarpa bukit atas dan hutan pergunungan bawah juga kaya dengan genus yang biasa ditemui seperti Syzygium dan Tristaniopsis. Dominasi spesis dipterokarpa berakhir pada ketinggian kira-kira 1000 hingga 1200m a.s.l (hutan pergunungan bawah) dan digantikan oleh spesis Mempening (Quercus dan Lithocarpus) dan Berangan (Castanopsis). Genus lain yang agak mudah dijumpai termasuklah Agathis, Dacrydium, Baeckea, Leptrospermum dan Podocarpus.

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APPROVAL SHEET

I certify that this research project report entitled "Tree Diversity and Composition in An Area Between Upper Hill Dipterocarp Forest and Lower Montane Forest of, Jerai Forest Reserve " by Muhammad Adzim Ariff Bin Mohd Ariff has been examined and approved as a partial fulfilment of the requirements for the Degree of Bachelor of Forestry Science in the Faculty of Forestry, Universiti Putra Malaysia.



Prof. Dr. Mohamed Zakaria Bin Hussin (Dean) Faculty of Forestry Universiti Putra Malaysia

Date: JANUARY 2019

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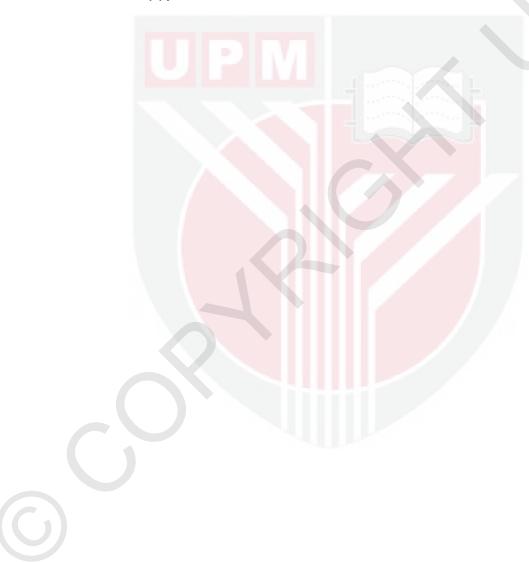
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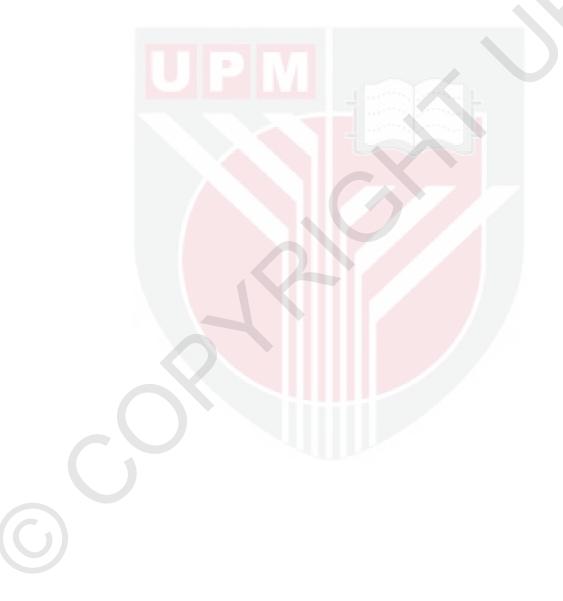
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LIST OF ABBREVIATIONS

Sg.	Sungai
Bt.	Batu
FR	Forest Reserved
a.s.II	Above sea level
sp.	Species
На	Hectare
М	Meter
H'	Shannon Index
1-D	Simpson's Index
E	Species Evenness
IVi	Important Value index

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CHAPTER 1

INTRODUCTION

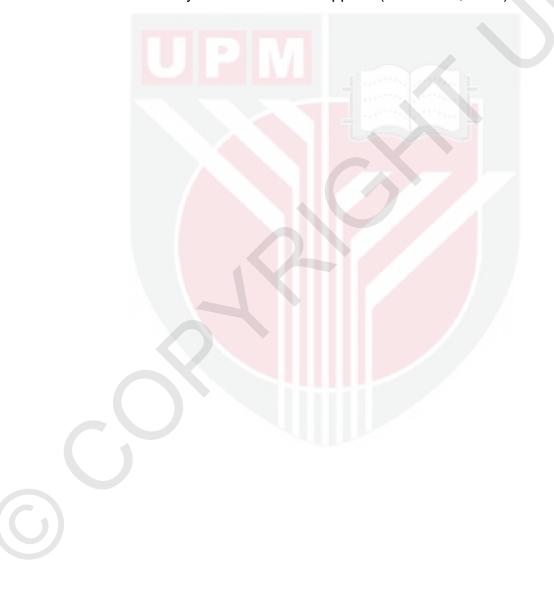
1.1 Background

Tropical forests are the subject of several studies to better understand the role that they could play in sustainable development, climate change, and floristic biodiversity. According to Basnet (1992), tropical forests are classified as a high biodiversity forest and the indicator for high biodiversity forests are depends on the species richness and the abundance of, the individuals' tree in the forests. The diversity of the vegetation can integrate by several parameters such as the vegetation structure and dynamics (Koubouna et al., 1992). Understanding the composition of the vegetation and also the stand structure of each particular forest are necessary as the species composition and species population size can tell us the tolerance of prevailing environmental condition, amount of rainfall per year, soils structure and also the history of that forests.

Tropical forests are at the critical rate due to the overexploitation and deforestation. Needs of local people and their activities had affected the tropical forests (Sagar & Singh, 2003). FAO (2010) states that in between 1990 and 2005, 13 million hectares of tropical forests a year are lost due to deforestation and degradation of forest and it became the cause to species extinction. Tropical deforestation and degradation of forest had brought international concern over forest composition and tree species.

1

According to Gibbs et al. (2010), to determine the nature and distribution of biodiversity of the forests to be managed, biodiversity inventories are used. Using resource inventory as a basis of stand structure, species composition and dynamic is important for development of strategies for achieving sustainable forests management. Furthermore, in determining the degree of variability of tree species within a community or a region, species diversity is one of the analytical tools that will applied (Bello et al., 2013).



1.2 **Problem Statement**

Forest type in Malaysia can be divided by lowland dipterocarp forest, upper hill dipterocarp forest, montane forest, oak-laurel forest, mangrove forest, swamp forest, limestone forest and quartz ridges forest (Maniam & Singaravelloo, 2015). The different type of forests located at different elevation and in term of species richness and the composition of species, it is also show significant differences (Brown & Lugo, 1990). The mixed vegetation of upper hill dipterocarp forest and lower montane forest in the study area such as in Jerai Forest Reserve is an interesting place to study. Most studies for tree diversity in Peninsular Malaysia mainly done in hill and upper hill dipterocarp forest such as in Ulu Muda, Kedah. However, area between montane forest and upper hill dipterocarp is rarely studied. The number of species for Dipterocarpaceae will also decrease in higher elevation. The uniqueness of this mixed vegetation can provide the new data on the species composition and can be used for the sustainable management of that forest.

1.3 Objectives

The objectives of this study are:

- To determine the tree composition, diversity and species richness at the area between lower montane forest and upper hill dipterocarp forest of Gunung Jerai Forest Reserve.
- 2. To study the forest structure at the area between lower montane forest and upper hill dipterocarp forest of Gunung Jerai Forest Reserve.



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