EFFECTS OF FOREST PATCH SIZE ON BUTTERFLIES IN URBAN FOREST

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EFFECTS OF FOREST PATCH SIZE ON BUTTERFLIES IN URBAN FOREST

By

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DEDICATION

For my beloved family:

Mohd Joni Bin Mohd Jahis

Rosnah Binti Hamzah

Also my siblings

To all my friends,

Thank you for your encouragements supports

And the sacrifices that you have given

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

ABSTRACT

Habitat destruction caused by urbanization can lead to fragmentation of forests. With the loss of habitats, the biodiversity in these habitats will also become threatened. One of the taxa that has been threatened by habitat loss is butterfly. This study investigated the abundance and species richness of butterfly within fragmented urban forests in the state of Selangor and their relation to size of forest patch. These forests were Ayer Hitam Forest Reserve (AHFR), Bangi Forest Reserve (BFR), Bukit Cerakah Forest Reserve (BCFR) and Sungai Lalang Forest Reserve (SLFR). Point count transect was used to collect the data. Thirty sampling points using systematic sampling with a random start were established at all four study sites. The AHFR had the highest butterfly abundance and species richness. The reason for this was because the size of the AHFR was bigger compared to the other two forest patches and the distance of the AHFR was relatively close to the SLFR. However, more research should be done on the biodiversity of these forest patches and butterflies in urban areas.

ABSTRAK

Kemusnahan habitat disebabkan oleh urbanisasi boleh menyebabkan pemecahan hutan. Dengan kehilangan habitat, biodiversiti di habitat tersebut juga akan terancam. Salah satu spesies yang menghadapi ancaman kepupusan ini adalah rama-rama. Kajian ini menentukan kelimpahan dan kekayaan spesies rama-rama di dalam hutan bandar yang mengalami fragmentasi di Negeri Selangor dan hubungan mereka dengan saiz tompok hutan. Hutan yang terlibat adalah Hutan Simpan Ayer Hitam (AHFR), Hutan Simpan Bangi (BFR), Hutan Simpan Bukit Cerakah (BCFR) dan Hutan Simpan Sungai Lalang (SLFR). Transek titik digunakan sebagai kaedah untuk mengumpul data. Tiga puluh titik pensampelan secara sistematik dengan permulaan rawak telah dijalankan di semua tapak kajian. AHFR mempunyai kelimpahan dan kekayaan spesies rama-rama yang paling tinggi. Sebabnya ialah saiz AHFR adalah lebih besar berbanding dengan dua lagi kawasan hutan dan jarak AHFR juga adalah dekat secara perbandingan dengan SLFR. Walau bagaimanapun, lebih banyak penyelidikan harus dilakukan ke atas kepelbagaian biologi tompok-tompok hutan ini di bandar.

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APPROVAL SHEET

I certify that this research project report entitled "**Effects of Forest Patch Size on Butterflies in Urban Forest**" by Anis Liyana Binti Mohd Joni 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.

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LIST OF ABBREVIATIONS

AHFR	Ayer Hitam Forest Reserve
BFR	Bangi Forest Reserve
BCFR	Bukit Cerakah Forest Reserve
SLFR	Sungai Lalang Forest Breserve
DBH	Diameter at Breast Height
GPS	Global Positioning System

CHAPTER 1

INTRODUCTION

1.1 General Background

Forest clearance due to logging activities can cause changes in animal communities. These alterations causes the forest, that was originally there, to decreases in size thus creating forest patches which will be more and more isolated as time goes by. Oxford dictionary defined patch as a part of something marked out from the rest by a particular characteristic. But in the context of ecology it is defined as a relatively homogeneous area that differs from its surroundings (Forman, 2014). These patches are originally a part of a bigger forest but thanks to these landscape modification done by humans they have become separated. Landscape modification by humans are by far the largest modern reason for habitat fragmentation, habitat loss and the reducing levels of biodiversity worldwide (Saunders *et al*. 1987 ; Henle, Davies, Kleyer, Margules & Settele 2004).

Habitat destruction basically leads to fragmentation which can be define as the breaking of large, contiguous, forested areas into smaller pieces of forest, typically these pieces are separated by roads, agriculture, utility corridors, subdivisions, or other human development or as defined by Franklin, Noon and George (2002), the disruption, as a result of a given arrangement of structure in the spatial dispersion of resources and conditions exhibit in a

territory at a given scale that influences occupancy, reproduction, or survival of a specific species.

With loss of habitat, eventually the biodiversity in those habitat will also become loss. Major landscape modification and biodiversity loss in the tropics affected numerous species (Sodhi *et al*. 2004). Southeast Asia has suffered the biggest losses of biodiversity of any tropical region in the world over the past 50 years (Wilson *et al*., 2015). Wilson continued on to say that "Malaysia is a biodiversity hotspot in the heart of Southeast Asia with roughly the same number of mammal species, three times the number of butterfly species, but only 4% of the land area of Australia". With this we can say that Malaysia is blessed with a wide range of biodiversity but these numbers can easily decline if we continue to ignore our forest's health. But this fact can easily change if we kept on increasing the cities developments and urbanisation without considering the biodiversity.

1.2 Problem Statement

With the rapid growth of urbanizations the size has been declining. This raises question if our forest health is also declining as much as the sizes. Butterflies are very sensitive to their environment and thanks to this, butterfly have the potential of being a good biological indicator. This study was conducted due to the fact that there are little study on butterflies has been done in fragmented forest that is surrounded by urbanization.

1.3 Aim and Objectives

The aim of this study was to quantify the abundance and species richness of butterfly in urban forest patches. In addition, this study were conducted to compare the abundance and species richness of butterfly between forest patches and lastly to contrast habitat quality between forest patches.

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