INSECTIVOROUS BAT ASSEMBLAGES IN RELATION TO SPATIAL ASPECTS OF VIRGIN JUNGLE RESERVES IN PENINSULAR MALAYSIA

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ABSTRACT

The tropical region supports the highest diversity of bat fauna known. Reasons for their success are mainly due to their large geographical ranges, the diversity of habitats, various foraging strategies and the tendency to exhibit a variety of roosting behaviour. This study addresses the issue of insectivorous bat distribution in relation to spatial aspects such as geography, size, distance and topography. This information was gathered from the 958 individuals and 27 insectivorous bat species that were captured and identified over a span of 18 months. This study which included six virgin jungle reserves of various sizes across Peninsular Malaysia revealed that the Peninsular is dominated mainly by the Hipposiderids and Rhinolophids family and that bat species composition is driven by elevational range and forest surroundings, and not by geography. As for the effect of primary habitat size, this study showed that VJR size did not show any correlation with insectivorous bat assemblages. The impact of VJR size class on its surrounding logged over forest indicated that the population of bats 200 m away from the VJR tend to increase with increasing VJR size but the proportion of bats furthest away from the VJR (> 600 m) decreased. Although topography did not have an effect on bat distribution within each site, bat abundance and species richness were the highest at the valley. Despite the various aspects of a forest (topography, size, distance, etc.), there is no one single reason behind bat species distribution, but an interaction of a few factors. Different species tend to be most abundant around their environmental optimum. Therefore conservation strategies should focus on determining a balance forest structure for the survival of each bat species.

ABSTRAK

Hutan tropika dikatakan mempunyai kepelbagaian kelawar yang paling tinggi. Ini kerana kelawar dapat menguasai kebanyakan kawasan geografi, habitat, mempunyai pelbagai cara untuk mencari makanan dan tempat berlindung. Objektif utama kajian ini adalah untuk mengkaji kesan kepelbagaian kawasan hutan seperti faktor geografi, saiz dan jarak hutan primer (VJR) dan topografi ke atas komuniti kelawar pemakan serangga. Kajian ini telah dijalankan di enam hutan simpan dara yang terdiri daripada pelbagai saiz di Semenanjung Malaysia. Melalui hasil kajian ini, 958 individu yang terdiri daripada 27 spesis kelawar serangga menunjukkan bahawa kebanyakan kelawar di Semenanjung Malaysia di dominasi oleh kelawar dari famili Hipposideridae dan Rhinolophidae. Faktor geografi didapati tidak mempengaruhi komposisi spesis kelawar tetapi sebaliknya dipengaruhi oleh ketinggian kawasan dan mutu persekitaran hutan tersebut. Saiz hutan primer (VJR) juga tidak menunjukkan sebarang korelasi dengan populasi kelawar. Bagi kesan saiz VJR dengan kawasan hutan di sekitarnya pula, didapati semakin besar saiz VJR semakin kurang kelawar yang ditangkap pada jarak 600 m dari sempadan VJR. Topografi (tebing, cerun, lembah) juga tidak menunjukkan kesan terhadap taburan komuniti kelawar. Tetapi kawasan lembah jelas menunjukkan bahawa ia menjadi tumpuan kebanyakan kelawar kerana bilangan individu dan spesis yang ditangkap di kawasan tersebut adalah paling tinggi. Walaupun terdapat banyak aspek hutan yang boleh mempengaruhi taburan komuniti kelawar di dalam hutan, namun tidak ada satu faktor yang boleh menentukannya. Ini kerana setiap spesis mempunyai kawsan tarikannya yang tertentu

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF SYMBOLS AND ABREVIATIONS

VJR	Virgin Jungle Reserve
ca.	Circa (approximately)
°C	Degree Celsius
%	Percentage
asl	above sea level
F.R	Forest Reserve
m	meter
m^3	meter cube
cm	centimeter
DBH	diameter at breast height
>	More than
<	Less than
≥	Equal or more than
/	Divide
IUCN	International Union for the Conservation of Nature
S.E.	Standard Error
FRI	Forest Research Institute (now known as Forest Research Institute of Malaysia - FRIM)
Min.	Minimum
Max.	Maximum
pers. obs.	Personal observation