

COMPARATIVE STUDY OF BACTERIAL DIVERSITY AND  
FLORA SUCCESSION ON CARPET GRASS MATTING  
IN AN OPEN AREA AND UNDER SHADY  
TREE CANOPY MATTING, KUALA  
LUMPUR, MALAYSIA

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FAKULTI SAINS DAN TEKNOLOGI  
UNIVERSITI MALAYSIA TERENGGANU  
2007

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LP 17 FST 3 2007



1100051207

Comparative study of dipteran diversity and their succession on  
rabbit carrion in two different mangrove areas in UMT,  
Terengganu and Masai, Johor / Lim Su Ping.



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COMPARATIVE STUDY OF DIPTERAN DIVERSITY AND THEIR  
SUCCESSION ON RABBIT CARRION IN TWO DIFFERENT MANGROVE  
AREAS IN UMT, TERENGGANU AND MASAI, JOHOR

By

Lim Su Ping

Research report submitted in partial fulfilment of  
the requirement for the degree of  
Bachelor of Applied Science (Biodiversity Conservation and Management)

Department of Biological Sciences  
Faculty of Science and Technology  
UNIVERSITI MALAYSIA TERENGGANU  
2007

1100051207

This project should be cited as:

Lim, S.P. 2007. Comparative study of dipteran diversity and their succession on rabbit carrion in two different mangrove areas in UMT, Terengganu and Masai, Johor. Undergraduate thesis, Bachelor of Applied Science in Biodiversity Conservation and Management, Faculty of Science and Technology, Universiti Malaysia Terengganu , Terengganu. 74p.

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Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: COMPARATIVE STUDY OF DIPTERAN DIVERSITY AND THEIR SUCCESSION ON RABBIT CARRION IN TWO DIFFERENT MANGROVE AREAS IN UMT, TERENGGANU AND MASAI, JOHOR oleh LIM SU PING, no. matrik: UK11047 telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Biologi sebagai memenuhi sebahagian daripada keperluan memperolehi Ijazah Sarjana Muda Sains Gunaan (Pemuliharaan Dan Pengurusan Biodiversiti), Fakulti Sains dan Teknologi, Universiti Malaysia Terengganu.

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## ACKNOWLEDGEMENTS

First and foremost, I would like to thank Puan Wahizatul Afzan Azmi, my supervisor for being generous in sharing her knowledge and also exposing me to what this research is all about. Her guidance and invaluable opinions has made my research possible and successful.

Thanks also goes to the Faculty of Science and Technology for allowing me to use their facilities. I would also like to thank the laboratory assistant of Histology lab, Mr. Mohammad bin Embong for his advice and co-operation by providing the useful advice and logistic requirements. Without his support, I may not complete this report on time.

My deep gratitude goes to my family, my parents and brother for their unconditional love and support. Thanks also to my housemates: Lee Swee Yin and Tan Lih Yan, who tolerated me emotionally during my hard days in completing this project. I herewith gratefully acknowledge my coursemates, James Chye Tze Wuen, Farah Hanim, Sharmila, Long Seh Ling and Chan Shiao Ee for their pleasant company, advice and help solving the problems I encountered.

Last but not least, in order not to leave anyone out, thank you to all who were involved directly or indirectly during the completion of my project.

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## LIST OF ABBREVIATIONS

<i>C. megacephala</i>	-	<i>Chrysomya megacephala</i>
<i>C. rufifacies</i>	-	<i>Chrysomya rufifacies</i>
KOH	-	Pottasium hydroxide
m	-	meter
mm	-	milimeter
sp	-	species
°C	-	degree celcius
%	-	percentage

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## ABSTRACT

A study on dipteran was carried out in UMT, Terengganu and Masai, Johor mangrove areas using rabbit carrions as models to assisting investigation of unattended deaths. The aim of this study is to determine the dipteran's diversity, succession, development and climatological factors affecting dipteran diversity over decomposition period. Dipteran's inventory revealed that a rich collection of 229 individuals belonging to 11 species from six families of Diptera were successfully identified at both study sites on October and December 2006 which belonging to the following families: Calliphoridae, Muscidae, Sarcophagidae, Phoridae, Lauxanidae and Fannidae. *Chrysomya megacephala* and *C. rufifacies* were found to be the most abundant species recorded in this study. More species were collected from Masai with 10 species compared to UMT with nine species. However, Mann-Whitney test did not show significant difference ( $z = -0.487$ ,  $p = 0.626$ ) among the individuals represented at each study sites as all the study areas consist of similar microhabitats. Calliphoridae predominated in the carrion during the fresh, bloat and active decay stages of decomposition. Two unique species, *Homoneura tineta* and *Cestrotus* sp. which commonly found in mangrove areas were identified. Dipteran's development was documented to be climatologically dependent whereby; low temperature and high rainfall inhibit their development and colonization. *t*-test and Mann Whitney test showed that mean relative humidity ( $t_{0.05, 19} = 5.992$ ) and rainfall ( $z = -3.051$ ,  $p = 0.002$ ) showed significant different between these two study sites. Major application of the succession pattern and development is to estimate Postmortem Interval (PMI). Findings of this study are significant to provide baseline information on the dipteran's fauna and improve forensic entomology database which is lacking in our region.



# KAJIAN PERBANDINGAN TENTANG KEPELBAGAIAN DAN SESARAN DIPTERA PADA BANGKAI ARNAB DI DUA KAWASAN PAYA BAKAU YANG BERBEZA DI UMT, TERENGGANU DAN MASAI, JOHOR

## ABSTRAK

Satu kajian mengenai Diptera telah dijalankan di kawasan paya bakau UMT, Terengganu dan Masai, Johor dalam membantu penyiasatan kematian tanpa saksi. Tujuan kajian ini adalah untuk mengenalpasti kepelbagaian, sesaran, perkembangan dan cuaca yang mempengaruhi diversiti diptera sepanjang tempoh penguraian. Senarai Diptera menunjukkan sebanyak 229 individu terdiri daripada 11 spesies dan enam famili telah berjaya dikenalpasti untuk kedua-dua kawasan kajian pada bulan Oktober dan Disember 2006 di mana terdiri daripada famili berikut: Calliphoridae, Muscidae, Sarcophagidae, Phoridae, Lauxanidae and Fannidae. *Chrysomya megacephala* dan *C. rufifacies* merupakan spesies paling dominan dalam kajian ini. Lebih banyak spesies diperolehi daripada Masai iaitu sebanyak 10 spesies berbanding dengan UMT dengan hanya 9 spesies. Walau bagaimanapun, Ujian Mann-Whitney tidak menunjukkan perbezaan yang ketara ( $z = -0.487$ ,  $p = 0.626$ ) antara bilangan individu di kedua-dua kawasan kajian disebabkan oleh mikrohabitat yang agak sama di kedua-dua kawasan kajian. Calliphoridae merupakan famili yang paling dominan semasa peringkat penguraian segar, bengkak dan aktif. Dua species yang unik, *Homoneura tinctoria* dan *Cestrotus* sp. yang biasanya dijumpai di kawasan paya bakau telah dikenalpasti. Kajian ini membuktikan perkembangan diptera adalah bergantung kepada keadaan cuaca di mana suhu yang rendah dan hujan lebat boleh menghalang perkembangan dan pengkolonian serangga. Ujian  $t$  dan ujian Mann-Whitney menunjukkan purata kelembapan relatif ( $t_{0.05, 19} = 5.992$ ) dan jumlah hujan ( $z = -3.051$ ,  $p = 0.002$ ) menunjukkan perbezaan yang ketara di antara kedua-dua kawasan kajian. Aplikasi utama corak kejayaan dan perkembangan serangga adalah untuk menganggar jeda pos-mortem. Hasil kajian ini dapat memberikan informasi yang penting mengenai fauna Diptera dalam memperbaiki kekurangan maklumat entomologi forensik di negara ini