

THE ECOLOGY OF DECOMPOSITION ON RABBIT
CARCASSES IN VARIOUS HABITATS AND ITS
IMPLICATIONS IN FORENSIC ENTOMOLOGY IN
MALAYSIA

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AUGUST 2012

ACKNOWLEDGEMENT

My gratefulness to Almighty Allah s.w.t for His blessings; had given me the ability and energy to complete this research project entitled “The Ecology of Decomposition on Rabbit Carcasses in Various Habitats and Its Implications in Forensic Entomology” successfully.

I would like to express my appreciation to the Dean, Prof. Dato’ Dr. Khalid Yusoff for the opportunity to be enrolled in Advanced Medical Science program and to be able to conduct a research during my undergraduate study.

For all that I have gained throughout this year, I would like to express my sincere thanks to my supervisor for this project, Mr. Heo Chong Chin for the guides from the very beginning, for the advises through the good and tough times, for providing materials and equipments, for the times spent, sharing of experiences and enthusiastic support upon this project from the start until the end. Thank you for your professional and excellent supervision that have been rendered. Besides, I would like to thank my co-supervisor, Prof. Bahaa Latef for his advises moral supports, ideas and sharing of experiences throughout this year.

I gather my appreciation to Dr. David Evans Walter from University of Alberta, Canada, Dr. Bruce Halliday from Australian National Insect Collection, Australia, Dr. Hiromu Kurahashi from International Department of Dipterology, Tokyo, Japan and Ms. Nurul Ashikin from Universiti Malaya for their helps in confirmation and identification of specimens.

Finally, I would like to thank the Faculty of Medicine, UiTM for excellent research facilities and the financial support for my project presentations in local and international conferences. My deepest thanks to my parent and friends for their helps, supports and prayers throughout this one year, and many other people for their invaluable contributions in completing this project, may God give His blessings to all.

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ABSTRACT

The stages of decomposition and the faunal succession on rabbit carcasses in three different habitats, namely jungle, rural and highland areas were studied. Three New Zealand White rabbit (*Oryctolagus cuniculus*) carcasses weighing approximately 2 kg were sampled daily until the decomposition process completed. Representative specimens of adult flies, larvae, pupa and mites were collected from the carcasses and processed in the laboratory. There were differences in decomposition rate and faunal succession between the carcasses. The fastest rate of decomposition was recorded in rural area and the slowest rate of decomposition was recorded from highland area. The carcasses exhibited the same pattern of colonization by flies, however, the dominant species of larvae and adult flies on each carcass were different. The primary species of flies recorded in jungle were *Chrysomya megacephala*, *Achoetandrus rufifacies*, *Chrysomya chani*, *Chrysomya villenuevi*, *Chrysomya nigripes*, *Chrysomya pinguis*, *Hemipyrellia ligurriens*, *Hemipyrellia tagaliana*, *Hypopygiopsis fumipennis*, *Hypopygiopsis violacea* and *Ophyra spinigera* represented by both adults and larvae, meanwhile *Musca domestica*, *Atherigona* sp., *Lioproctia pattoni*, *Lioproctia saprianovae* and *Seniorwhitea princeps* were represented by adults only. The biodiversity of flies in the rural area were *Ch. megacephala*, *Ac. rufifacies*, *H. ligurriens*, *Fannia canicularis*, *Ophyra chalcogaster* and *O. spinigera* represented by both adults and larvae, meanwhile *Musca domestica*, *Atherigona* sp., *Boettcherisca peregrina*, *Parasarcophaga taenionota*, *Parasarcophaga scopariiformis* and *S. princeps* were represented by adults only. Meanwhile the species of flies collected in the highland area were *Lucilia porphyrina*, *Ch.*, *Ac. rufifacies*, *Ch villenuevi*, *Ch pinguis*, *H ligurriens*, *Ospinigera*, *O chalcogaster*, *Fa canicularis* and *Boettcherisca highlandica* were represented by both adults and larvae, meanwhile *Ch nigripes*, *Chrysomya thanomthini*, *M domestica*, *Atherigona* sp., *Parasarcophaga albiceps*, *P taenionota*, Sepsidae, Phoridae and Millichidae were represented by adults only. Faunal succession followed the sequence of dominant flies i.e. Calliphoridae, Sarcophagidae, Muscidae, Sepsidae and lastly Stratiomyidae (for jungle), or Sepsidae for rural and highland studies. We also recovered Mesostigmata, Prostigmata, Astigmata and Oribatida mites throughout decomposition which could be used for future implementation in forensic investigations. The data obtained from this study provides more accurate indicators to local forensic scientists in solving criminal cases especially on determination of time and primary location of death.

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CHAPTER I

INTRODUCTION

1.1 FORENSIC ENTOMOLOGY

Forensics is the application of a broad spectrum of sciences in respond to interest of a legal system which may be related to a crime or a civil action. There are various subdivisions, namely criminalistics, forensic cremation, forensic toxicology, forensic anthropology, forensic pathology and forensic entomology.

The scientific study of insects of which from arthropod subphylum, is known as entomology. Entomology (from Greek *entomon*, "that which is cut in pieces or engraved/segmented", hence "insect"; and *logia*, "the study of"). There are as many as 3 to 30 million of insects may actually exist as they are the most diverse group of animal, even though only less than a million species have been described and named. Insects are generally known for having chitinous skeleton, three parts of body namely head, thorax and abdomen, three pairs of jointed legs, compound eyes and two antennae. They are found in nearly all terrestrial habitats and in most aquatic habitats as well, but not in the salt water (Byrd & Castner, 2001). Some are herbivores, carnivores, detritivores or parasites yet others are generalists that consume a variety of foodstuffs. Insects consume foods as human beings did, occupy our dwellings and even use