DIVERSITY AND MICROHABITAT PREFERENCES
OF CROMITES LARVAE

ASHRIMI BT AHMAD

FAKULTI SAINS DAN TEKNOLOGI
UNIVERSITI KEBANGSAAN MALAYSIA

2008

DIVERSITY AND MICROHABITAT PREFERENCES OF ODONATES LARVAE

By
Asmariah Binti Ahmad

A Research Report submitted in partial fulfillment of
the requirements for the award of the degree of
Bachelor of Applied Science (Biodiversity Conservation and Management)

DEPARTMENT OF BIOLOGICAL SCIENCES
FACULTY OF SCIENCE AND TECHNOLOGY
UNIVERSITI MALAYSIA TERENGGANU
2008

This project should be cited as:

Asmariah, A. 2008. Diversity and Microhabitat Preferences of Odonates Larvae. Undergraduate thesis, Bachelor of Applied Science (Biodiversity Conservation and Management), Faculty of Science and Technology, University Malaysia Terengganu. 76pp.

JABATAN SAINS BIOLOGI
FAKULTI SAINS DAN TEKNOLOGI
UNIVERSITI MALAYSIA TERENGGANU

PENGAKUAN DAN PENGESAHAN LAPORAN
PROJEK PENYELIDIKAN I DAN II
RESEARCH REPORT VERIFICATION

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: **DIVERSITY AND MICROHABITAT PREFERENCES OF ODONATES LARVAE** *oleh* **ASMARIAH BT AHMAD**, no. matrik: **UK11463** 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.

Disahkan oleh: / Verified by:

b/p .....

Penyelia Utama/*Main Supervisor*

Nama: **PN WAHIZATUL AFZAN BT AZMI**

Cop Rasmi: **FAZILAH BINTI ARIFFIN**
Pensyarah
Jabatan Sains Biologi
Fakulti Sains dan Teknologi
Universiti Malaysia Terengganu
21030 Kuala Terengganu.

Tarikh: 11/5/08

.....

Penyelia Utama/*Main Supervisor*

Nama: **EN AMIRRUDIN BIN AHMAD**

Cop Rasmi:

Tarikh: .....

.....

Ketua Jabatan Sains Biologi/*Head, Department of Biological Sciences*

Nama: **PROF MADYA DR. AZIZ BIN AHMAD**

Cop Rasmi:

Tarikh: 11 MAY 2008

PROF. MADYA DR. AZIZ BIN AHMAD
Ketua
Jabatan Sains Biologi
Fakulti Sains dan Teknologi
Universiti Malaysia Terengganu
21030 Kuala Terengganu

ACKNOWLEDGEMENT

I extend all glory, honor and thanks to the most gracious, loving and merciful Creator of all. His love has given me meaning, endowed me with amazement over the many wonders he has created and their masterful intertwining that sustains it all. Indeed, I have found that the most amazing of his created treasures must be the stream ecosystem and have relished the opportunity to work in one.

I wish to thank the numerous people who have assisted me in the completion on my thesis. This work would not have been possible without the help of many persons that contribute in one way or another. Firstly, my heart-felt thanks are a pathetically inadequate expression for all I owe my both supervisor; Encik Amirrudin Ahmad and Puan Wahizatul Afzan Azmi for their advice, assistant, expertise, generosity and patience during these years; but especially for believing in me.

I would like to express my gratitude to all lecturers of Biological Department especially Cik Jamilah and Cik Nor Zalipah for the ideas, guidance, training, helpful comments and suggestions throughout the completion of this project. I offer my special appreciation to Encik Johari for his invaluable technical and field assistance as well as Encik Syed Ahmad Rizal Tuan Nek for helping in identification work.

I also express my gratitude to the many people who volunteered their time to help with field work and data collection including Azwa, Lin, Waed, Faezah, Fahmi, Amzar, Duke, and Zared. I extend appreciation to the undergraduate students, for giving the moral support in finishing this work. And last but not less important, my beloved friend Waed, Fik, Azwa and Lin for unconditional love, patience and helping me in every way they could.

Finally, I am indebted to my parents, brothers and sisters, for their love, company, support which was a tremendous inspiration to me.

DECLARATION

I hereby declare that this thesis entitled Diversity and Microhabitat Preferences of Odonates Larvae is the result of my own research except as cited in the references.

Signature : .....

Name : Asmariah Binti Ahmad

Matrix No : UK11463

Date : 11 May 2008

ABSTRACT

The order Odonata, is one of the most well-known and well documented insects for its adult stage, but the larval stage remain poorly known. This study was conducted three states namely Terengganu, Johor and Pahang, aimed to investigate the diversity of odonate (Order: Odonata) larvae and their microhabitat preferences. A rich collection of 301 individuals belonging to 55 genus from 15 families of Odonata were successfully recorded from twenty microhabitats selected, from August 2007 until January 2008. Anisopterans (239 individuals) were found to be more abundant than zygopterans (62 individuals), with Libellulidae (suborder Anisoptera) made up the most dominant family collected with 49.2% of total individuals recorded. *Zygonyx* sp. and *Neurothemis* sp. were found to be the most abundant species recorded in this study. More individuals were collected from freshwater inland and peat swamp than stream. Root of vegetation I (MH4) and riparian vegetation II (MH12) had showed the highest diversity and species richness of odonates larvae compared to other microhabitats. Kruskal-Wallis analysis showed that all microhabitats had significant differences based on sites and the total number of individuals (K=0.041, $P<0.05$) as well as between sites and the total number of families (K=0.025, $P<0.05$). By using Spearman Correlation analysis, dissolved oxygen (DO) and pH are positively correlated (r^2=0.713, r^2=0.653, $P>0.05$) with the number of individual collected while water temperature was negatively correlated (r^2=-0.575, $P<0.05$). The microhabitats were also clustered according to their value of Sorensen's Coefficient of similarity using Unweighted Pair Group Method with Arithmetic averages (UPGMA) method. Rantau Abang estuarine (MH18) show no similarity to all microhabitats, while MH4 and MH8 show the highest similarity between them. This study findings show the freshwater and peat swamps support richer diversity of odonates larvae and more preferred microhabitat than riverine ecosystem.

ABSTRAK

Order Odonata, merupakan salah satu kumpulan serangga yang diketahui umum dan didokumentasi secara jelas bagi peringkat dewasa, tetapi peringkat larvanya masih kurang diketahui. Kajian ini telah dijalankan di 3 buah negeri; Terengganu, Johor dan Pahang, untuk mengkaji diversiti larva (Order: Odonata) dan kecenderungan pemilihan mikrohabitatnya. Suatu koleksi yang kaya dengan 301 individu mewakili 55 genus dari 15 famili telah berjaya direkodkan dari 20 buah mikrohabitat terpilih, bermula Ogos 2007 sehingga Januari 2008. Anisoptera (239 individu) mempunyai kelimpahan yang lebih tinggi berbanding Zygoptera (62 individu), dengan Libellulidae (suborder Anisoptera) sebagai famili dominan yang dengan 49.2% daripada jumlah keseluruhan individu yang direkodkan. *Zygonyx* sp. dan *Neurothemis* sp. merupakan spesies yang terbanyak dijumpai. Lebih banyak individu telah disampel di paya air tawar dan paya gambut berbandang kawasan sungai. Akar tumbuhan I (MH4) dan tumbuhan riparian II (MH12) menunjukkan diversiti dan kekayaan spesies larva Odonata yang tinggi berbanding mikrohabitat yang lain. Analisis Kruskal - Wallis menunjukkan terdapat perbezaan yang signifikan di antara kawasan kajian dengan jumlah keseluruhan individu (K=0.041, $P<0.05$) begitu juga bagi kawasan kajian dengan jumlah keseluruhan individu (K=0.025, $P<0.05$). Dengan menggunakan analisis Korelasi Spearman, oksigen terlarut (DO) dan pH berkait secara positif (r^2=0.713, r^2=0.653, $P>0.05$) dengan jumlah individual yang direkodkan manakala pula suhu air berkait secara negatif (r^2=-0.575, $P<0.05$). Mikrohabitat juga telah dikelompokkan berdasarkan nilai Pekali Sorensen's dengan menggunakan kaedah UPGMA. Kawasan muara Rantau Abang (MH18) tidak menunjukkan persamaan dengan mikrohabitat yang lain, manakala MH4 dengan MH8 menunjukkan nilai persamaan yang paling tinggi. Kajian ini mendapati, paya air tawar dan paya gambut menampung kekayaan spesies yang tinggi dan lebih cenderung dipilih oleh larva odonata berbanding ekosistem sungai.