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DISTRIBUTION AND ABUNDANCE OF AQUATIC INSECTS BASED ON RAPID ASSESMENT METHOD AT STREAM OF TERENGGANU AND TUMPAT ESTUARY, KELANTAN.

By

Nor Zulaikha binti Che Mat

Research Report submitted in partial fulfillment of
The requirements for the degree of
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Department of Biological Science
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UNIVERSITY MALAYSIA TERENGGANU
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JABATAN SAINS BIOLOGI
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RESEARCH REPORT VERIFICATION

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: **DISTRIBUTION AND ABUNDANCE OF AQUATIC INSECTS BASED ON RAPID ASSESSMENT METHOD AT STREAMS OF TERENGGANU AND TUMPAT ESTUARY, KELANTAN** oleh Nor Zulaikha Binti Che Mat, no. matrik: UK10314 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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LIST OF ABBREVIATIONS

ANOVA	Analysis of variance
ASPT	Average Score Per Taxon
BMWP	Biological Monitoring Work Party
cm	centimeter
COND	Conductivity
DO	Dissolve oxygen
FBI	Family Biotic Index
g	gram
GPS	global positioning system
L	Liter
m	meter
mg	miligram
mg	milligram
ms	millisecond
MVSP	Multivariate Statistic Package
no	number
°C	Degree Celsius
s	second
TEMP	Temperature
TSS	Total suspended solid

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ABSTRACT

The study was conducted at eight streams in various parts of Terengganu and an estuary in Tumpat, Kelantan between 22 May 2006 until 13 October 2006. They were Sungai Jeneris, Sungai Nerus, Lata Tembakah, Lata Belatan, Sungai Kemat, Belukar Bukit and two unnamed streams of Bukit Bauk. A total of 1431 aquatic insects' individuals were collected, consisting of seven orders and 43 families. Perlidae from the order Plecoptera had the highest collected individuals (34%) followed with Hydropscychidae (22%) (order Trichoptera) and Heptageniidae (16%) (order Ephemeroptera). Lata Tembakah recorded the most individuals collected with 423 while Tumpat was the least with 46 individuals only. Rocky streams beds, fast flowing water with little debris and forest litter maximized the collection of aquatic insects in some streams. Family Biotic Index (FBI), Biological Monitoring Work Party (BMWP) and Average Score Per Taxon (ASPT), indicated that all study sites were in good water quality although some study sites were punctuated by agriculture and residential areas. Kruskal-Wallis analysis showed that all study sites had significant differences based on sites and the total numbers of individuals with significant value of 0.021 as well as between sites and the total numbers of species with significant value of 0.009. Dissolved oxygen (DO), and total suspended solid (TSS) interacted positively (r^2=0.833, r^2=0.900) with the number of individuals collected while water temperature was negatively (r^2=-0.731) correlated. The study sites were also clustered according to their value of Sorensen's Coefficient of similarity. Based on this, Tumpat showed least similarity to all study sites, thus indicated that the sites probably very less similar to the others based on the occurrence of aquatic insects. Its brackish water might have an impact on the abundance of aquatic insects recorded there. Other sites which mainly are head water streams, relatively very similar in terms of aquatic insects' occurrences. From this study, it showed that aquatic insects reacted on component of habitat and their adaptation for the distribution and abundance.

KAJIAN KE ATAS TABURAN DAN KEDAPATAN AKUATIK BERDASARKAN KAEDAH PENILAIAN PANTAS DI SUNGAI-SUNGAI DI TERENGGANU DAN MUARA TUMPAT, KELANTAN

ABSTRAK

Kajian telah dijalankan ke atas lapan sungai di Terengganu dan satu kawasan muara di Tumpat, Kelantan. Sungai-sungai tersebut ialah Sungai Jeneris, Sungai Nerus, Lata Tembakah, Lata Belatan, Sungai Kemat, Belukar Bukit dan dua sungai di Bukit Bauk. Sejumlah 1431 individu serangga akuatik dapat di kutip yang terdiri daripada tujuh order dan 43 famili. Perlidae dari order Plecoptera menunjukkan jumlah individu terbanyak (34 %) selain Hydropscychidae (22 %) dari order Trichoptera dan Heptageniidae (16 %) dari order Plecoptera. Lata Tembakah mengumpulkan paling banyak individu dengan bilangan 423 dan Tumpat adalah yang paling sedikit iaitu 46 individu. Tumpat juga menunjukkan komposisi serangga akuatik yang agak berlainan. Permukaan sungai yang berbatu, aliran air yang deras, bersama-sama dengan sedikit sisa dan sampah hutan memaksimumkan kutipan serangga akuatik di sesetengah kawasan kajian. Menggunakan indeks-indeks biologi seperti Family Biotic Index (FBI), Biological Monitoring Work Party (BMWP) and Average Score Per Taxon (ASPT), dapat dilihat semua kawasan kajian mempunyai kualiti air yang baik walaupun di sesetengah kawasan, terdapat kegiatan pertanian dan penempatan. Analisis Kruskal-Wallis menunjukkan terdapatnya perbezaan antara kawasan kajian dengan jumlah individu dengan nilai signifikasi iaitu 0.021 dan kawasan kajian dengan jumlah spesis yang di sampel (0.009). Oksigen terlarut dan jumlah pepejal terampai menunjukkan perkaitan secara positif dengan jumlah individu yang di kumpul manakala suhu air berkait secara negatif. Kawasan kajian juga turut di kelaskan berdasarkan nilai persamaan Sorrenson Coefficient. Dari sini, jelas menunjukkan yang bahawa Tumpat berbeza dari kawasan kajian lain dan perbezaan ini berdasarkan kedapatan serangga akuatik. Air paya ini mungkin mempunyai impak ke atas kelimpahan serangga akuatik yang di rekodkan di sini. Kawasan lain yang semuanya air tawar secara relatifnya mempunyai kesamaan dalam kedapatan serangga akuatik. Hasil kajian mendapati serangga akuatik bergantung kepada komponen habitat dan adaptasi mereka dalam menentukan taburan dan kedapatannya di sesuatu kawasan kajian.