توصيف مواطن يرقات البعوض في بيئات الحضر بالقاهرة الكبرى

رســـالة

مقدمة كجزء متمم للحصول على درجة الماجستير

في العلوم (الحشـــــرات)

من

شريف السيد السيد السيد عمار

بكالوريوس علوم

قسم علم الحشرات

كليــة العلــوم

جــامعة عيــن شمس

٢٠١٢

Characterization of Mosquito Larval Habitats in Urban Environments of Greater Cairo

Thesis
Submitted in partial fulfillment
of the requirements for the degree of
Master of Science

by
Sherif El-Sayed El-Sayed El-Sayed Ammar
B.Sc - Entomology

Department of Entomology
Faculty of Sceince
Ain Shams University
Cairo- Egypt

2012

Thesis Examination Committee

Name Title Signature

.....

.....

.....

Supervisors

Prof. Hashim A. Abd El-Rahman
Entomology Department - Faculty of Science – Ain Shams University

Prof. Mohamed A. Kenawy
Entomology Department - Faculty of Science – Ain Shams University

Prof. Adel F. Hamed
Botany Department - Faculty of Science – Ain Shams University

Dedication

To the pillars of my life:

My family and **my best friends**

You are the world to me and without you, my life would fall apart, I love you …

Biography

Name: Sherif El-Sayed El-Sayed Ammar

Date of birth: 17-8-1982

Degree awarded: B.Sc. Entomology, 2005, Faculty of Science, Ain Shams University, Egypt.

Occupation: Teaching assistant, School of Science and Engineering, Biology Department, American University in Cairo

Date of registration for M.Sc. degree: July, 2008

ACKNOWLEDGEMENTS

These printed pages hold far more than the culmination of years of study; they also reflect the relationships with many generous and inspiring people I have met since beginning my graduate work.

I am heartily thankful to my advisor, **Prof. Hashim A. Abd El-Rahman**. He offers wise advice and generous suggestions whenever I need him. I cannot emphasize enough how strongly I appreciate the effort that he put into revising and correcting the manuscript. Besides, he serves as a role model of a typical Egyptian professor who cares and loves his students as if they were his own kids. Thanks Prof. Abd El-Rahman.

Foremost, I offer my sincerest gratitude and appreciation to my advisor **Prof. Mohamed A. Kenawy**, for his enthusiasm, inspiration, motivation, patience, immense knowledge and his great efforts to explain things clearly and simply. He provided encouragement, sound advice, good teaching, good company and lots of good ideas. I would have been lost without him. One simply could not wish for a better or friendlier advisor. I'm forever grateful. Thank you.

I am also indebted to **Prof. Adel F. Hamed** for his commitment, perpetual energy, thoughtful criticism, insightful comments, motivating discussions and for the final proof reading at such short notice.

At this moment of accomplishment, I pay homage to my guide and the godfather of this work, **Prof. Adel M. Gad**, as he set up the thesis point and its work plan. Under his guidance, he embraced me with passion in his laboratory for two years at Research and Training Center (RTC). He has taught me how good research is performed, both at the lab and field scales. He has been supportive since the days I began working, I remember he used to say "be an employee" to encourage me being a punctual and dependable person. I really owe him a lot. Thank you for everything.

I take this opportunity to sincerely acknowledge **Prof. Ragaa E. Hammad** for her constant moral support and helpful suggestions and comments before and throughout the progress of this thesis. Thank you very much.

Most of the statistical analysis described in this thesis would not have been obtained without a close collaboration with **Dr. Yousrya M. A. Abdel-Hamid**, Research Institute of Medical Entomology, Ministry of Health. I really owe a great deal of appreciation to her.

I also would like to thank **Dr. Edwin Cruz-Rivera**, Assistant Professor of Marine Biology, American University in Cairo, who is one of the most inspiring people I have ever met, for his advice and help, especially in the moments when crucial decisions had to be made.

Last but not least, I expand my thanks to **Prof. Nadia Abu-Gabal**, Head of Entomology Department, Faculty of Science, Ain Shams university and all members of the Department and Research and Training Center (RTC) for being more than a family to me, especially **Dr. Hala Khater**, **Sahar Mahmoud**, **Sawsan Moustafa** , **Fatmah Abdel Moneam**, **Enas Ghallab** and **Noha Abdel Badee**. You are the best company ever. Thank you for being who you are.

ABSTRACT

The ecology of mosquito larvae was investigated over a 17 month period in two localities in Cairo representing different levels of urban planning: El-Muqattam (M, planned safe and planned unsafe) and Abu-Seir (A, unplanned unsafe). Sampling frames were obtained by using a geographic information system (GIS) to subdivide satellite images of the study areas. Thirty seven water bodies in the selected grid cells (20 % of cells) were identified and characterized based on physical, chemical and biological parameters. Six mosquito species (*Culex pipiens*, *Cx. perexiguus*, *Cx. pusillus*, *Ochlerotatus caspius*, *Anopheles multicolor* and *Culiseta longiareolata*) were identified from the two localities. From these, the filarial vector, *Cx. pipiens,* was the most common species; suggesting a threat of filaria transmission in these two localities specially (A) as being adjacent to endemic areas. Of the different types of breeding habitats, cesspits (M) and drainage canals (A) were the most common; while springs (M) and drainage canals were the most productive type. Both *Cx. pipiens* and *Cx. perexiguus* breed all year round with peaks of abundance coincided with high temperatures. The association of the mosquito species with the physical, chemical and biological characteristics of their breeding habitats was examined. The occurrence of mosquito species did not relate to the occurrence of 13 algal taxa and 2 aquatic plants for most comparisons. In contrast, there was a relation between *Cx. pipiens* and the occurrence of 3 algae *(P*<0.05, chi-squared analysis). The densities of both *Cx. pipiens* and *Cx. perexiguus* in the two localities were directly related to temperature, pH, DO and nitrite but indirectly related to the salinity and turbidity of the breeding water. These findings contribute to our understanding of the interactions between mosquito larvae and the biotic and abiotic components of the urban environment. This is important for planning a relevant and effective control program in Egypt.

Key words: Mosquito larvae, breeding sites characterization, monthly abundance , Cairo, , urban areas, El-Muqattam, Abu-Seir.

CONTENTS

LIST OF TABLES

LIST OF FIGURES