UNIVERSITI TEKNOLOGI MARA

EFFECT OF TEMPERATURE ON THE LIFECYCLE OF *Aedes albopictus* (DIPTERA: CULICIDAE) IN DIFFERENT TYPES OF WATER HOLDING CONTAINERS

SITI NADIATUL MAULA BINTI MISUAN

Project submitted in fulfilment of the requirements for
the degree of
Bachelor in Environmental Health and Safety
(Hons.)

Faculty of Health Sciences

July 2018

DECLARATION BY STUDENT

Project entitled "Effect of temperature on the lifecycle of *Aedes albopictus* (Diptera:Culicidae) in different types of water holding containers" is a presentation of my original research work. Whenever contributions of others are involved, every effort is made to indicate this clearly, with due reference to literature, and acknowledgement of collaborative research and discussions. The project was done under the guidance of Project Supervisor, Dr Nazri bin Che Dom. It has been submitted to the Faculty of Health Sciences in partial fulfilment of the requirement for the Degree of Bachelor in Environmental Health and Safety (Hons).

Students's signature:

……

(Siti Nadiatul Maula Binti Misuan)

2014264286

930417-10-5424

Date: .....

ACKNOWLEDGMENT

First and foremost, praises and thanks to the God Almighty, for giving me the strength, knowledge, ability and opportunity to undertake research study entitled *"**EFFECT OF TEMPERATURE ON THE LIFECYCLE OF Aedes albopictus (SKUSE) (DIPTERA:CULICIDAE) IN DIFFERENET TYPES OF WATER HOLDING CONTAINER".*** Without his blessings, this achievement would not have been possible.

I would like to express my deep and sincere gratitude to my research supervisor **Dr Nazri Bin Che Dom** for his patience and invaluable guidance throughout this research. His dynamism, vision, sincerity and motivation have deeply inspired me. I am extremely grateful to have a supervisor who cared so much about my work, and who responded to my questions and queries so promptly. I am extending my heartfelt thanks to all lecturers in Department of Environmental Health and Safety in Faculty of Health and Science who have involved directly or indirectly throughout my study in UiTM Puncak Alam. My sincere thanks also goes to all the staff from the department, insectarium and laboratory for their guidance and cooperation in the completion of the research.

I have great pleasure in acknowledging my gratitude to my colleagues from HS243, especially vector team who always providing their heartfelt support and motivation throughout my journey completing this study. Finally, I would like to express my sincere gratitude to my family for their love, understanding, prayers and continuing support to complete this research work. This thesis heartily dedicated to my late father whose dreams for me have resulted in this achievement. May the Almighty God richly bless all of you.

TABLE OF CONTENTS

ABSTRACT

An understanding of the ecological factors and population bionomics of *Aedes albopictus* can improve control and mitigate the incidence of dengue (DF) and dengue hemorrhagic fever (DHF). The depth knowledge on the biology of dengue vector is crucial to understand various aspect of the disease, including control programme and future outcome. The development performance and survival rate of *Ae. albopictus* were investigated under four temperatures in response with different types of water and water holding containers which conducted at insectarium UiTM Puncak Alam. Based on the observation, the development performance and survival of the vector mosquito was increased with the increasing of temperature. These findings also showed rain water and coconut shell provide better development rate compared to tap water and plastic cup respectively. The hatching success was 91.7% in rain water and declined to 2% when hatched in tap water. An *Ae. albopictus* reared in coconut shell showed 50% pupation on day 5 with highest pupation occurring at the maximum temperature, 35°C. Under four constant temperature ranging from 20°C to 35°C, the highest mortality rate recorded at the maximum temperature. The size of wing reared at the minimum temperature, 20°C was significantly longer than maximum temperature, 35°C. The findings of this study are discussed in the context of changing or increasing water temperature, favourable types of water and preferable water holding containers in vector population and vector competence. Using these key factors control strategies are recommended to manage vector populations as expected increases in temperatures.

Keywords: *Aedes albopictus, temperature, types of water, water holding containers*