

**UNIVERSITI TEKNOLOGI MARA**

**EFFECT OF DIFFERENT  
TEMPERATURE ON SURVIVAL  
RATE AND LIFE CYCLE OF OIL  
PALM BAGWORM, *METISA PLANA*  
(LEPIDOPTERA: PSYCHIDAE)  
UNDER CONTROLLED CONDITION**

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**MSc**

**February 2021**

## AUTHOR'S DECLARATION

I declare that the work in this dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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## ABSTRACT

Temperature is one of the most important abiotic factors that affects insect life cycle. Unpredictable local climate changes in Malaysia had caused the outbreak of bagworm, *Metisa plana* for over five decades. This had led to a major problem of oil palm yield production. Hence, it is significant to study the nature of this pest especially their life cycle to prevent further outbreak. This study is expected to provide *M. plana* surveillance program planning that can prevent massive damage of defoliation from occurring. The application to control bagworm should be applied at the right time especially during the crucial climate changes that could triggers bagworm's life cycle. The main objective in this study is to evaluate the life cycle of oil palm bagworm, *M. plana* in different degree of temperature. The ranges of temperature selected were between 16°C to 40°C. This study was conducted under controlled conditions in the laboratory from October 2017 until October 2018. The study was done by daily observation and recorded the duration in days from egg to adult stages. This study found that bagworm was able to adapt and complete life cycles at selected temperatures between 20°C to 36°C, but did not survive at 16°C and 40°C. The duration observed the completed life cycle of this species significantly decreased with increase in temperature. The duration in days of completed life cycle of temperature at 20, 24, 27.5, 32 and 36 °C was approximately 122.2±0.87, 108.4±1.74, 99.6±1.89, 81.2±1.70 and 64.8±1.25 respectively. The optimum temperature of the bagworm's survival rate was 32°C with a total percentage of 63.48%. This study provides basic fundamental information on the life cycle of bagworm, *Metisa plana* especially for oil palm growers. Hence, growers will have better pest management plans to control this bagworm species and prevent yield loss of fresh fruit bunch (FBB) of oil palm plantation per acre. This recent knowledge of biology in the life cycle of *Metisa plana* should be done at least every six to seven years. It is expected that this study could provide *Metisa plana* surveillance program planning that can prevent massive damage of defoliation from occurring.

## ACKNOWLEDGEMENT

First of all, I wish to thank God that with His guidance for giving me the opportunity to embark my Master and completing this long journey and challenging journey successfully. My gratitude and thanks go to my respected supervisor Prof. Madya Dr. Siti Noor Hajjar Md Latip. Thank you for the support, supervision, lessons, patience and ideas in assisting me with this project.

My appreciation goes to Universiti Teknologi MARA Shah Alam for supporting this work through the BESTARI Research Grant (600-IRMI/DANA5/3/ BESTARI 058/2017).

I also would like to express my gratitude to the Field Unit staff of FELDA Gunong Besout, Sungkai, Perak especially providing the facilities, knowledge and assistance during the sampling.

This thesis is dedicated to my beloved family for become my source of strength, happiness and support. Lastly, huge thanks for each and every one who helped directly and indirectly for this project from start until the end. Praise be to the God.

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