



UNIVERSITI PUTRA MALAYSIA

**COMPARISON ON THE ABUNDANCE OF POLLINATING WEEVIL
(*Elaeidobius kamerunicus*) IN IMMATURE AND MATURE OF OIL PALM
(*Elaeis guineensis*)**

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By

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CERTIFICATION

This project entitled "Comparison on The Abundance of Pollinating Weevil (*Elaeidobius kamerunicus*) In Immature and Mature Oil Palm (*Elaeis guineensis*) is prepared by Muhamad Zia Hul Haq Bin Din and submitted to Faculty of Agriculture in partial fulfilment of the award of the degree of Bachelor of Agriculture Science.

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ABSTRACT

Elaeidobius kamerunicus is a pollinating weevil of oil palm from the Order coleoptra was introduced and imported from Africa to improved pollination and increased fruit set for oil palm plantations in Malaysia. It was successfully established in Malaysia oil palm plantation in the middle of 1981. The aim of this study were: 1) to determine the abundance of *E. kamerunicus* on the male and female inflorescences; 2) to compare the population of *E. kamerunicus* in immatured and matured oil palm; and 3) to investigate the relationship of temperature and relative humidity (RH) pattern with the abundance of *E. kamerunicus*. This sampling was conducted in immature oil palm (less than 5 years) and matured oil palm (more than 5 years) in different plots. From each plot, 5 male and female inflorescences were randomly. For each male inflorescences, five spikelets were randomly chosen from each upper, middle and lower level of the inflorescent. Each male chosen spikelet were covered with plastic to prevent the escape of the weevils. All the spikelets were cut and brought to the laboratory for further investigation. While the female inflorescences flower, the weevils were sampled by using aspirator. The temperature and relative humidity were taken three times for each different age plot by using Data Logger. In this study, there was a significant difference ($P < 0.05$) in the abundance of *E. kamerunicus* between sampling time in male inflorescences while in female inflorescences there was no significant difference ($P > 0.05$). The abundance of *E. kamerunicus* was not significantly different between the immature and mature oil palm. The abundance of *E. kamerunicus* shows that the highest in number when there wa low relative humidity.

ABSTRAK

Elaeidobius kamerunicus merupakan kumbang pendebungaan bagi pokok kelapa sawit berasal dari Order Coleoptera ialah salah satu serangga yang telah diperkenalkan dan diimport dari Afrika bagi menambahbaik pendebungaan dan meningkatkan set buah-buahan untuk ladang kelapa sawit. Ianya telah berjaya dibawa ke ladang kelapa sawit Malaysia pada pertengahan 1981. Tujuan kajian ini ialah 1) untuk menentukan banyak *E. kamerunicus* pada bunga jantan dan betina; 2) untuk membandingkan populasi *E. kamerunicus* pada pokok kelapa sawit yang sudah dan belum matang; 3) untuk menyiasat corak hubungan suhu dan kelembapan relatif dengan banyaknya *E. kamerunicus*. Kajian ini akan dijalankan dengan menggunakan pokok kelapa sawit yang tidak matang (kurang dari 5 tahun) dan pokok kelapa sawit yang matang (lebih dari 5 tahun) pada plot yang berbeza. Dari setiap plot, 5 bungan jantan dan betina diambil secara rawak. Bagi setiap pendebungaan jantan, lima spikelet telah dipilih secara rawak daripada beberapa tingkat iaitu peringkat atas, tengah dan bawah. Setiap spikelet jantan yang dipilih ditutup dengan menggunakan plastik untuk mengelakkan kumbang tersebut daripada terlepas. Semua spikelet dipotong dan dibawa ke makmal untuk proses selanjutnya. Manakala pada bunga betina, kumbang pendebungaan ini diambil dengan menggunakan penyedut. Suhu dan kelembapan relatif telah diambil sebanyak tiga kali untuk setiap plot dengan menggunakan Data Logger. Di dalam kajian ini, terdapat perbezaan yang signifikan ($P < 0.05$) dalam bilangan *E. kamerunicus* antara waktu sampel dijalankan pada bunga jantan sementara pada bunga betina, tidak terdapat perbezaan yang signifikan ($P > 0.05$). Tiada perbezaan signifikan diantara banyaknya *E. kamerunicus* terhadap kelapa sawit yang matang dan tidak matang. Kelembapan relatif menunjukkan bahawa apabila ia rendah, populasi dan bilangan *E. kamerunicus* paling tinggi.

CHAPTER 1

1.0 INTRODUCTION

Elaeidobius kamerunicus (Curculionidae: Coleoptera) which pollinating weevil of oil palm from the Order Coleoptera is an exotic insect in Malaysia. It was introduced and imported from Africa to improved pollination and increased fruit set for oil palm plantations. In June 1980, Datuk Leslie Davidson and Datuk Dr. Rahman Anwar Syed bought 1,044 weevil pupae for that purpose. Population fluctuation of *E. kamerunicus* usually effect on the seasons. The lowest level of population fluctuation during dries seasons and highest in wet seasons.

This insect was first release in the middle February 1981 and established throughout the West Malaysia and Sabah (Mohd Basri et al., 1984). This insect is very important for the palm oil production because after established to our country, it has increased our production up to 20 to 30% (Syed, et. al. 1982; Basri et. Al. 1983) and decreased the labour cost. Our government take serious attention to this pollinating weevil because palm oil is the highest export value crop in Malaysia. Second largest producer of palm in the world after Indonesia make our government focus more for this crop compare to other crop. Even though after replacement of Dura variety, the yields is not good as much as with the introduction of the weevils. It is very helpful in the pollination process that was done by hand normally before because the number of weevils itself and the ways that they brings the pollen from the male to the female inflorescence.

Weevil population density varies between localities and time depending on the biotic and abiotic surroundings. This study is very important to investigate and study because this kind of weevil pollinator very lack in information especially in Malaysia. This study will investigate the abiotic factors that cause the abundance of this insect and how this factor affects the population. The result from this study can help our farmers and plantation to

make prediction of the population in the future to get better management and can enhance the fruitsets and bunch weight to increase our oil palm yields.

In general, this experiment was carried out to achieve the objectives:

- 1) To determine and compare the abundance of *Elaeidobius kamerunicus* on the male and female inflorescences.
- 2) To compare the abundance of *Elaeidobius kamerunicus* in mature and immature oil palm.
- 3) To investigate the abundance effects of temperature and relative humidity (RH) on the abundance of *Elaeidobius kamerunicus*.

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