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SPECIES ASSEMBLAGES OF PALM WEEVILS (*Rhynchophorus* SPP.) IN THREE DIFFERENT COCONUT PLANTATIONS IN WESTERN SARAWAK, MALAYSIA

Nurul Hafizah Yusuf, Wan Nurainie Wan Ismail*,
Ratnawati Hazali & Siti Nurlydia Sazali
Faculty of Resource Science and Technology,
Universiti Malaysia Sarawak,
94300 Kota Samarahan,
Sarawak, Malaysia
*Corresponding author: *wiwnurainie@unimas.my*

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ABSTRACT

A study on the species assemblages of palm weevils was conducted in three different coconut plantations in Western Sarawak, Malaysia, which included Beliong, Kota Samarahan and Lundu districts, respectively, from December 2019 until February 2020. Pheromone traps and food-baited traps were deployed during this study. Total of nine individuals representing *Rhynchophorus vulneratus* (Red Stripe Weevil) were recorded while one individual was suspected to be *R. ferrugineus* (Red Palm Weevil). This study suggests that the differences in colour and markings on the elytra of *R. ferrugineus* captured may be influenced by environmental factors. The damages caused by *Rhynchophorus* species towards coconut trees in this study were also documented. Based on the Chi-Square analysis (X^2 (6, N = 10) = 12.59, p = 0.34), the preference of *Rhynchophorus* spp. toward the type of treatments is independent. Further studies or repetition should be conducted to consider longer trapping days and additional sampling areas.

Keywords: phytophagous insects, pheromone trap, *Rhynchophorus*, weevil

ABSTRAK

Satu kajian mengenai himpunan spesies kumbang tanduk palma telah dijalankan di tiga ladang kelapa yang berbeza di Sarawak Barat, Malaysia, iaitu di Beliong, Kota Samarahan, dan Lundu, dari Disember 2019 hingga Februari 2020. Perangkap feromon dan perangkap berumpan makanan telah digunakan dalam kajian ini. Sebanyak sembilan individu *Rhynchophorus vulneratus* (Kumbang Tanduk Berjalur Merah) telah direkodkan, manakala satu individu disyaki *R. ferrugineus* (Kumbang Tanduk Merah). Kajian ini mencadangkan bahawa perbezaan warna dan corak pada elytra *R. ferrugineus* yang ditangkap mungkin dipengaruhi oleh faktor persekitaran. Kerosakan yang disebabkan oleh spesies *Rhynchophorus* terhadap pokok kelapa dalam kajian ini turut didokumentasikan. Berdasarkan analisis Chi-Square (X^2 (6, N = 10) = 12.59, p = 0.34), ini menunjukkan bahawa kecenderungan *Rhynchophorus* spp. terhadap jenis rawatan adalah bebas. Kajian lanjut atau pengulangan kajian disarankan dengan tempoh perangkap yang lebih lama serta penambahan kawasan persampelan.

Kata kunci: serangga fitofaj, perangkap feromon, *Rhynchophorus*, kumbang tanduk

INTRODUCTION

The palm weevils of the genus *Rhynchophorus* (Herbst 1795) are significantly known as pests to a broad range of palm species (family Aracaceae) including coconut, sago, oil palm and dates worldwide (Hoddle & Hoddle 2016; Sukirno et al. 2018). Coconut plantation is one of the principal economic crops grown in Malaysia. Coconut also has become a unique source for various natural products, especially medicines and for development of industrial products (DebMandal & Mandal 2011). However, pest infestation of palm weevils on coconut plantations causes massive destruction to this crop and results in a low number of productions. Palm weevils infest coconut palms throughout their life cycle. As adults, they move to a new healthy palm after destroying the previous host(Azmi et al. 2013), despite various treatments like insecticide application (Azlina et al. 2024). However, infestations are often detected only when the palm is critically damaged or dead (Azmi et al. 2017). There is limited knowledge about the species assemblages of palm weevils in coconut plantations in Sarawak. A previous report by (Kueh Tai 2013) from the Department of Agriculture, Sarawak, recorded only *R. vulneratus*, the local indigenous species. This study aims to identify the palm weevil species infesting coconut plantations in Sarawak and determine the most effective trap for mass trapping. The findings will contribute to developing best management practices for controlling palm weevils.

MATERIALS AND METHODS

Sampling Sites

This study was conducted at three different coconut plantations in Western Sarawak, Malaysia namely Kampung Tambirat Beliong, Cocoa Research and Development Centre (CRDC) field centre owned by Malaysian Cocoa Board (MCB), Kota Samarahan and Cocoa Research Centre (CRC), Lundu Station owned by MCB in Lundu, Kuching.

Insect Sampling

Pheromone traps (Ferrolure +) and food-baited traps were used in this study, following (Azmi et al. 2014) with small modifications. The traps were designed by using 7-L polypropylene buckets with 3 cm diameter holes cut at 4 cm below the upper rim of the bucket. The pheromone was placed at the same height as the 3 cm diameter holes, with the function of the hole being to provide access for the weevils to enter. The outer surface of the bucket was covered using a sackcloth to provide friction for the weevils and prevent them from easily falling off. In addition, water and detergent were added inside the trap during the trap installation. Water was needed to maintain the moisture inside the trap and prevent weevils from escaping the bucket, while detergent was used to kill the weevils as it will break the surface tension of the water. Blue-coloured traps were used, as recommended by Al-Saoud (2013). Table 1 shows the type of treatments and the number of traps used in three different coconut plantations. Each treatment was deployed for 14 days in each location. A randomized block design (RCBD) was applied in the setup of the four treatments including control in each coconut plantation (Figure 1).