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Entomofaunal Diversity of Class Insects from Selected Oil Palm Plantation in Bukit Perah, Banting, Selangor

Nurin Amanina Mohd Zaini[a], Siti Khairiyah Mohd Hatta[a*]

Structured Abstract

Background: Oil palm plantations are seen as problematic due to their negative environmental impacts, leading European countries to ban palm oil. However, oil palm plantations are still diverse compared to other agricultural systems because the presence of vegetation like shrubs provides food and habitat for animals such as insects. This study aims to quantify insect diversity within oil palm plantations, which serves as a baseline for future biodiversity research. This knowledge can help address concerns about palm oil boycotts and counter negative perceptions, which is crucial for our economy as the world's second-largest palm oil producer.

Methods: Malaise traps were set up in three different landscapes (edge, middle, and inner areas) within the oil palm plantation in Bukit Perah, Banting, Selangor, with each trap approximately 100 meters apart. Insect samples were collected after a month and sorted by order using forceps. The samples were examined based on morphology with a stereoscopic microscope to identify their species and order. They were then preserved in 70% alcohol and pinned in an insect box. All the data were analysed using diversity indices such as the Shannon-Wiener Diversity Index, Evenness Index, and Chao1 Richness Index.

Results: This study collected 8,218 insect individuals, representing 11 orders. Trap 3 (inner) captured the most orders, with 11 orders and 7,911 individuals. Trap 2 (middle) had 5 orders and 284 individuals. Trap 1 (edge) collected 7 orders and 23 individuals. The Generalized Linear Model (GLM) with a Poisson distribution showed significant differences in order distribution among traps ($P<0.05$). Diversity indices revealed that Trap 1 had the highest Shannon-Wiener Diversity Index (H' = 1.6290) and Evenness Index (E' = 0.7287) compared to Trap 2 (H' = 0.9646, E' = 0.5247) and Trap 3 (H' = 0.8859, E' = 0.2205). Trap 3 had the highest species richness (SChao1 = 11.000) compared to Traps 1 (SChao1 = 7.957) and 2 (SChao1 = 5.000).

Conclusion: In conclusion, despites negative perceptions for the oil palm industry in the relation to the loss of biodiversity, this study showed a high number of insects still can be found in the agroecosystem.

Keywords: Order, Traps, Shannon-Wiener Diversity Index, Evenness Index, Chao1 Richness Index

*Correspondence: sitikhairiyah@uitm.edu.my

[a]School of Biology, Faculty of Applied Sciences, Universiti Teknologi MARA, Shah Alam, Malaysia