

Diversity and Abundance of Lepidoptera in Selected Oil Palm Plantation in Banting, Selangor

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Structured Abstract

Background: The order Lepidoptera comprises moths and butterflies play a crucial role as an indicator of biodiversity in an ecosystem. Considering the history of oil palm plantations and their ambiguous effects on biodiversity, further study on their impact on local Lepidoptera populations is required. This study aimed to identify the diversity and abundance of Lepidoptera and their distributions in three different sites within the oil palm plantation at Banting, Selangor.

Methods: The method used for sample collection was the Malaise Trap placed in three different sites within the plantation, namely the Inner Trap, the Middle Trap and the Outer Trap. The samples collected were preserved in bottles filled with 70% alcohol. The identification process involved careful observation of the physical characteristics of the specimens, which were then compared to established reference books.

Results: A total of 13 Lepidopteran families were identified, from a total of 236 individuals collected. The families identified were Crambidae, Depressariidae, Erebidae, Gelechiidae, Geometridae, Hesperidae, Noctuidae, Nymphalidae, Pyralidae, Thyrididae, Tineidae, Tischeriidae, and Oecophoriidae. The family Crambidae was found the most while family Depressariidae and Thyrididae recorded the lowest number. The Inner Trap collected the highest number of individuals (231), the highest number of families (14), and the highest number of morphospecies (59). The Shannon-Wiener Diversity Index (H') showed that the Inner Trap had the highest diversity value with $H' = 2.014$, followed by the Middle Trap with $H' = 0.5623$, and the Outer Trap with $H' = 0$. The Margalef Index (R') also showed the highest value comes from the Inner Trap with $R' = 2.205$. Surprisingly, the Evenness Index (E') showed that the Outer Trap exhibited a complete evenness with $E' = 1$. The Kruskal-Wallis test was conducted, and the result showed no significant differences between the three different sites, where $p > 0.05$.

Conclusion: In conclusion, the study showed that Lepidoptera's overall diversity and abundance in three different sites in Oil Palm Plantation Banting, Selangor was low. This is attributable to plantation management practices, sunlight exposure, type of vegetation, and presence of possible predators.

Keywords: Lepidoptera, oil palm plantation, diversity, abundance

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