

Evaluating the Diversity and Abundance of Brachycera in Several Areas in the Felda Pasoh Oil Palm Plantation, Negeri Sembilan

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Structured Abstract

Background: Brachycera often have short, highly variable-shaped antennae on a sturdy body. The distribution and abundance of Brachycera (Diptera) in the Felda Pasoh 4 oil palm plantation have not been explored, leaving unknown species and environmental variations. The objectives of this study were to identify the diversity and abundance of Brachycera families and to evaluate differences in Brachycera family diversity and richness between areas located near and away from the forest within the Felda Pasoh 4, Negeri Sembilan.

Methods: Two Malaise traps were installed at two sampling locations inside an oil palm plantation in Felda Pasoh 4, Negeri Sembilan. The stations strategically positioned, where one was located far from the forest edge (Trap 1), while the other was located nearer the forest boundary in oil-palm (Trap 2). After a month, samples were taken from the Malaise trap collection bottle and sorted into their corresponding families based on their morphology and appearance.

Results: There was a total of 200 Brachycera individuals, representing 22 families and 44 different morphospecies. 121 individuals and 17 families were found in Trap 1 while 79 individuals with 12 families were recorded in Trap 2. The three highest-numbered families identified were the Dolichopodidae (67 individuals), Muscidae (33 individuals) and Drosophilidae (22 individuals). Trap 1 showed a higher Margalef's Richness Index ($R' = 3.336$) and Shannon-Weiner Diversity Index ($H' = 2.168$), suggesting that there was more species diversity and richness at this location. However, Trap 2 had a better Evenness Index ($E' = 0.6738$) than Trap 1 ($E' = 0.5143$), indicating a more equal distribution of species found. This study suggests that Brachycera abundance is higher in Trap 1 (far from the forest) compared to Trap 2 (near the forest) within the oil palm plantation. The Mann-Whitney U test showed a p-value of 0.013.

Conclusion: These findings help protecting important species and preserve ecological balance in agricultural contexts by directing policymakers and land-use planners towards more sustainable and conservation-conscious practices. By looking at the distribution and abundance of this order, the study helps with future research and studies on the species.

Keywords: Brachycera, Malaise traps, oil palm plantation, Shannon-Wiener Index, morphospecies.

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