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Preliminary Assessment of Coloured Pan Traps for Insect Sampling in Sri Lankan Home Gardens

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Abstract

Sri Lankan ecosystems are understudied, particularly concerning lower taxa, due to a lack of optimized sampling techniques suited to native conditions. This study assesses the effectiveness of coloured pan traps for insect sampling in low-land home gardens of Sri Lanka. Coloured pan traps, known for their adaptability in size, shape, colour, and installation height, are widely used to collect diurnal, flying, and visually foraging insects, especially pollinators. Their non-selectivity allows them to capture a diverse range of insect taxa effectively. This study's sampling was conducted in eight selected locations in the wet and intermediate zones. Circular plastic bowls; 15 cm in diameter; 6 cm in depth were used as traps in three colours; yellow, white, and blue. Traps were placed on the ground in an equilateral triangle formation, one meter apart, and filled with a soap solution. Traps were set at each site from 9.00 to 15.00 hours, and the captured specimens were subsequently identified in the laboratory to the highest possible taxonomic level. Results indicated three arthropod classes: Arachnida, Collembola, and Insecta, with insects comprising over 80% of the specimens across seven orders. Hymenoptera was the most abundant order, followed by Diptera, Hemiptera, Orthoptera, Coleoptera, Lepidoptera, and Thysanoptera. The species diversity of the orders followed a similar pattern. Order Hymenoptera exhibited the highest frequency of occurrence, followed by Diptera, and Hemiptera. Orders Thysanoptera and Lepidoptera had the lowest frequencies of occurrence. Yellow traps captured the highest number of specimens, followed by blue traps with white traps recording the fewest. This trend is consistent at the species level, though the differences are less pronounced. Results indicate that both yellow and white traps captured insects from all the orders while blue traps recorded a smaller number of orders. Hymenoptera, Diptera, Orthoptera, and Lepidoptera showed the highest capture in yellow. Hemiptera and Coleoptera had the highest capture in blue, while Thysanoptera showed the highest capture in white. Yellow and white traps captured more insects compared to blue traps in both the Wet and Intermediate zones. The traps resulted in a small bycatch of 17% ($\pm 14\%$) displaying a good specificity. In conclusion, yellow traps consistently resulted in a higher capture and species richness across most insect orders and locations. Anthophilic insect orders like Hymenoptera and Diptera showed the highest captures, confirming the suitability of yellow colour pan traps for pollinator monitoring in Sri Lanka. Further extensive sampling is recommended to validate these findings and to develop habitat-specific insect sampling techniques for Sri Lanka.

Keywords: *Coloured pan traps, Insect monitoring, Arthropod sampling, Home gardens, Biodiversity*