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Study on Butterfly Abundance and Diversity at the Western Boundary of Kanneliya Forest Reserve Edge

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Abstract

Butterflies play an important role in the ecosystem as a good bioindicator for a healthy ecosystem. This study was conducted to quantify the abundance of butterfly species, determine the species diversity and analyze relationships between their abundance and diversity, with habitat characteristics of the western boundary of Kanneliya forest reserve edge (6° 14 '10.14 " N, 80° 20’ 34.95" E) in Sri Lanka. Line transect method was used to conduct the survey in different habitats of the forest edge. The habitats were shrubland, forest patch, household area and tea plantation area. Hundred-meter long transects were established in each area with five meters of perpendicular distance. Thirty minutes were spent on each transect at weekly intervals with eight survey frequencies for two months from March to May, 2025. A total of 278 butterflies belonging to five (Hesperiidae, Lycaenidae, Pieridae, Papilionidae, Nymphalidae) out of the six families in Sri Lanka were recorded. Thirty-five butterfly species were recorded in the study with three endemic species (*Idea lasonia, Mycalesis rama, Trades darsius*). Species diversity was calculated using Shannon- Wiener index (H), and evenness index for each habitat was also assessed. The high H value was found in the household area (2.596) followed by the tea plantation (2.595) and the lowest in the forest patch (1.753). The lowest evenness was recorded in the household area (0.089) and the highest in the forest patch (0.215). There is no significant difference in butterfly abundance between the four different habitats (One way ANOVA, $p>0.05$), while the species richness in the forest patch is significantly lower than in other three habitats (One way ANOVA, $p<0.05$). Forest patch at the western boundary of the Kanneliya forest reserve edge shows less species diversity and richness, and higher species evenness compared to other habitats. This indicates a more uniform distribution of a few species of the butterfly community and necessitates conservation attention. On the other hand, although household areas and tea plantation areas have high diversity, there being highly vulnerable to habitat modification.

Keywords: *Butterfly abundance, Species richness, Species diversity, Forest edge, Habitats.*