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The Dung Beetle Diversity is Differently Affected by Land Use Types: A Case Study from Landuyaya, Belihuloya, Sri Lanka

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Abstract

Land use change is known to affect ecological processes and biodiversity, especially in highly diverse and fragmented areas. Scientific evidence on this can help sustainable land use management. As dung beetles (Scarabaeinae) are easy to survey, sensitive to habitat changes, and perform a variety of ecological tasks, they make an ideal biological indicator to study the relationship between land use change, diversity, and ecosystem function. This research was conducted in the Landuyaya, Belihuloya, Ratnapura, Sri Lanka to determine species richness and abundance of dung beetles in three different land use types, i.e., forest patches, agricultural lands, and home gardens. Sampling was conducted using baited pitfall traps to collect live dung beetles. A total of six traps were deployed for each collection effort for each land use type. These traps were left open for 48 hours, before being removed. Beetles were collected and identified using reference specimens. A total of 40 individuals from nine species were recorded in all land use types. From the collection, 20 individuals from seven species in forest patches, 16 individuals from five species in home gardens, and 01 individual in cultivation areas were identified. Tunneller beetle *Onthophagus unifasciatus* was dominant in all three land use types. The highest Shannon and Simpsons diversity index values (1.53 and 0.73) were recorded from forest patches in Landuyaya, whereas cultivation received the lowest Shannon diversity index value (0.95). The low levels of human disturbance, the presence of food sources from wild animals, and the lack of agrochemical use in the forest patches may contribute to the higher abundance and species richness of dung beetles in these areas. Human disturbance can fragment habitats causing loss of canopy cover and increased ground temperature which are critical environmental factors for Dung beetles, according to previous research. It also reduces the availability of food sources. Pesticides can also kill dung beetles directly and indirectly by harming their food sources. The results of this research could be used to communicate the negative impacts of land use change for Dung beetles, their importance, and promote better land use management strategies.

Keywords: Abundance, Dung beetles, Land use types, Species richness, Species diversity