

## DIVERSITY OF RODENTS AND TREESHREWS IN DIFFERENT HABITATS IN WESTERN SARAWAK, BORNEO

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A diverse community of 63 rodent species and nine treeshrew species are found in Borneo (Phillipps & Phillipps, 2016). They play an important role in providing ecosystem services by contributing to pollination, seed dispersal, and germination; and also food for larger carnivores (Shanahan & Compton, 2000; Morand *et al.*, 2006; Payne & Francis, 2007; Phillipps & Phillipps, 2016). Bornean tropical forests have been lost, degraded, and fragmented by anthropogenic activities since the early 1970s (Bryan *et al.*, 2013; Gaveau *et al.*, 2014), consequently created new or alternative habitats for rodents and treeshrews especially resilient, adaptive, or opportunistic species that can thrive in such disturbed areas while forest-dependent species would decline in number or become locally extinct (Traweger *et al.*, 2006; Palmeirim *et al.*, 2020).

This study was conducted to determine the species richness and abundance of rodents and treeshrews in four different habitats (i.e. forest, oil palm plantation, rural villages, and urban area) in the western part of Sarawak, Borneo. The data collected from this study is important and useful in contributing new knowledge on the occupancy of anthropogenically created habitats for rodents and treeshrews and gives an insight into how each rodent and treeshrew species responded to human disturbance in term of their species richness and abundance in each habitat type.

Live-trapping using baited cage traps was conducted in the western part of Sarawak (i.e. Bau District, Samarahan District, Serian District, and Kuching City), comprising of a total of seven forests (primary forest, secondary lowland agro-forest, limestone forest, and peat swamp forest), four oil palm plantations, six rural villages, and six urban areas. The trapping session in each habitat type was

stopped once the targeted number of 50 or more small mammals were caught. These four habitat types were selected because they are the main landscape in western Sarawak and have been subjected to different degrees of disturbance from a human. Forest sites were categorized as the least disturbed areas and urban sites as the most disturbed areas. Trapped rodents and treeshrews were anesthetized using chloroform (Ng *et al.*, 2017). Their morphometric measurements were taken and photographed to aid in species identification. The method of catching rodents and treeshrews generally followed that of Aplin *et al.* (2003). Identification of rodents and treeshrews was according to the field guide by Phillipps and Phillipps (2016). The species diversity of trapped rodents and treeshrews was determined based on the Shannon diversity index ( $H'$ ).

A total of 5924 trap nights yielded 239 individuals of rodents and treeshrews, comprising of 14 species, four species of treeshrews (family Tupaiidae), four species of squirrels (family Sciuridae), and six species of rats (family Muridae) (Table 1). The  $p$ -value obtained from the Kruskal-Wallis test shows the species diversity of rodents and treeshrews was significantly different ( $p=0.0058$ ) among forests, oil palm plantations, rural villages, and urban areas. Dunn's posthoc test shows the species diversity of these small mammals in forests was different from both rural villages and urban areas ( $p<0.05$ ). Forest harbored the most number of species (13 species) and the most diverse community ( $H'=1.941$ ). Although the forest sites in this study are accessible to human, it is still the least disturbed habitat compared to oil palm plantations, rural villages and urban areas. This result was similar to Bernard *et al.* (2009) and Wells *et al.* (2014) where the small mammal species richness was found to be higher in the forest than in other anthropogenically

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