

# TAXONOMY & ECOLOGY

*Beyond Classical Approaches*

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Fasihuddin B. Ahmad, Sepiah Muid, Isa B. Ipor,  
Ramlah Zainudin, Mohd Effendi Wasli,  
Meekiong Kalu & Zaini B. Assim



## REPETITIVE SAMPLING: SMALL MAMMALS LIVETRAPPING DATA AT KUBAH NATIONAL PARK, SARAWAK

Siti Hasmah, T., Siti Mariam, J. and \*Laman, C.J.M.

Department of Zoology  
Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak.  
\*Correspondent authors: cjlaman@frst.unimas.my

### ABSTRACT

Research on species diversity of small mammals was conducted in Kubah National Park by applying two variations of Repetitive Sampling Design: Staggered Sampling and Continuous Sampling. Grid sampling method was utilized; a hundred cage traps were set up and placed in a grid system at each study site respectively; mark-recapture procedures were used to capture the small mammals. A total of 10 species consisting of 98 individuals were captured in a total of 5000 trap/nights from staggered sampling, namely, *Maxomys rajah*, *M. surifer*, *M. whiteheadi*, *Leopoldamys sabanus*, *Lariscus insignis*, *Sundasciurus lowi*, *Tupaia tana*, *T. dorsalis*, *T. glis*, and *Echinosorex gymnurus*. 146 individuals from nine species were recorded: *Maxomys rajah*, *M. surifer*, *M. whiteheadi*, *Lariscus insignis*, *Sundasciurus lowi*, *Tupaia tana*, *T. dorsalis*, *T. glis*, *T. picta* and *T. gracilis*. Shannon Index (0.80211) and Simpson Index (0.773) from staggered sampling were higher than the indices from continuous sampling (Shannon Index= 0.44519, Simpson Index= 0.459). Zar t-test value showed that there was a significant different between two sampling design. From our study, we can conclude that species diversity from repetitive staggered sampling is significantly higher than repetitive continuous sampling.

**Keywords:** Repetitive sampling, small mammals, species diversity, trapping grid

### INTRODUCTION

Small mammals are any mammal species whose individual live weights do not exceed five kilograms as an adult (Hayward & Phillipson, 1979). Carey and Johnson (1995) further stated that small mammals increase species richness and functional diversity in ecosystems, while Fedriani *et al.* (2000) stated that small mammals are a vital prey for many species, including raptors, reptiles and other mammals. Small mammals also play a key role in the distribution of plant species (Mittelbach & Gross, 1984), as pollinators and maintaining the ecological balance (Francis, 2001).

Tuen *et al* (2001) conducted small mammals studies in Balambangan Island, Sabah and noted that small mammals diversity is affected by habitat loss and degradation at surrounding sampling area. There are some studies carried out in Kubah National Park by Ador *et al.* (2006), Mahyuddin (2007), and Zaharuddin (2009); these research are different in term of elevations, vegetation type, sampling design, type of trap use, and also varies type of baits. Nor (2001) carried out a study on elevational diversity patterns of small mammals on Mount Kinabalu, and noted that the total number of species captured at each site are not significantly

different and total number of species gradually decrease with increasing elevations. The conversion and loss of primary rainforest in Southeast Asia is presumed to affect many animals assemblages in terms of their diversity and species composition (Bernard *et al.*, 2009).

The objective for this research is to determine the species diversity of small mammals captured in two different repetitive sampling; to update the current state of species composition of small mammals for Kubah National Park (KNP) for future management plan; and to verify the significant different in two different sampling protocol based on the species richness and species evenness of small mammals caught.

### METHODOLOGY

#### *Study area*

Kubah National Park (KNP) is gazetted in 1989 and only opened to the public in 1995.. This national park dominated by a sandstone plateau and covered with 2230 hectares which consist largely of undisturbed natural forest, comprises of five main vegetation types; alluvial forest,