Bioacoustics as a Tool to Investigate Bat Diversity and Abundance Patterns in Selected Caves of the Biak-Na-Bato National Park, Bulacan

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Cave ecosystems are important habitats for many insectivorous bat species. In the Philippines, about 34% of bats depend on caves as roosting sites. Human activities like tourism, although provide a source of income to the local community, could pose a threat to this unique ecosystem and its inhabitants. Understanding cave ecology and tracking bat populations over time is important in cave management. Hence, to guide cave habitat management and bat species conservation, this study aims to establish baseline information on bat population and identify environmental factors that influence the diversity of bats in selected cave ecosystems in Biak-na-Bato National Park for long-term monitoring and management of the cave for ecotourism. To do this, an assessment and comparison of insectivorous bat species diversity and abundance using passive acoustic monitoring and harp trapping across four cave systems in Biak-na-Bato National Park, a karst forest landscape in Bulacan, Philippines will be conducted. The study will also examine the influence of microclimate variables, cave physical characteristics, and degree of human disturbance in each cave on bat species diversity and abundance. A bat acoustic reference call library, from captured bats, will be created to facilitate accurate acoustic species identification during bat emergence. Emerging bats will be recorded over three consecutive nights at each cave to measure bat species diversity and abundance. ANOVA/Kruskal-Wallis tests will determine if acoustic diversity and abundance significantly differ across the four caves, while generalized linear models will examine which factors most influence bat diversity and abundance. The selected caves will also be assessed using the Bat Cave Vulnerability Index by Tanalgo et al. (2018). The results of the study will enhance our understanding of cave conditions and bat cave use patterns in Biak-Na-Bato National Park for long-term monitoring of the bat population in caves and the impact of ecotourism. The baseline data could provide the park management with a better monitoring tool to effectively monitor, manage, and sustain the ecotourism activities and ensure the bat species population and their habitat are protected in the park.