

**Research Article**

# **Patterns of fruit bat diversity in forest fragments and exotic tree species-based reforestation areas within highly modified karst areas in the Philippines**

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## **ABSTRACT**

Karst forests are important habitat for many karst-associated species such as bats. However, there is paucity of comprehensive studies exploring the long-term responses of bats to fragmentation or conversion of their natural habitat in the karst ecosystems of Southeast Asia. In this study, we assessed the diversity, composition, abundance, and vertical stratification of fruit bats in forest fragments and exotic species-based reforestation areas within limestone quarries in Luzon and Mindanao sub-regions of the Philippines. Bats were sampled over a five-year period using mist nets set in the understory (0–3 m) and sub-canopy (4–15 m). A total of 15,332 individuals of fruit bats from 10 species were recorded from a total sampling effort of 4,014,878.4 mist-net hours (m<sup>2</sup>h). Each forest type exhibited uniqueness in bat composition, with some forest-associated species observed only in forest fragments whereas disturbance-tolerant species were more abundant in reforestation areas. Bat assemblage also differed between the vertical strata within each habitat type, with capture rates about six and two times higher in sub-canopy than understory in forest fragment and reforestation area, respectively. Lastly, abundance of bats showed relationship with area of forest fragment but not with reforestation age. These findings highlight the importance maintaining and expanding the forest patches within and adjacent quarry sites for bat conservation. Additionally, enhancing plant diversity in reforestation areas is crucial to attract fruit bats and expedite the process of forest regeneration in these degraded environments

**Key words:** Karst forest, Pteropodidae, Southeast Asia, mining areas, vertical stratification

