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BATS OF BAKO NATIONAL PARK, SARAWAK, MALAYSIAN BORNEO

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ABSTRACT

Two separate assessment on bats diversity were concluded in Bako National Park for 12 trapping-nights. Our first assessment was conducted from 8th to 12th February 2005 followed by the second assessment from 28th August to 3rd September 2005. A total of 295 individuals from 22 species of bats were captured using mist-nets and harp traps during the survey, which accumulated to 226 trapping-nights. *Hipposideros cervinus* was recorded as the most abundance species with 30.85% of total captures. A total of eight new records of bats have been added to this park: *Emballonura monticola*, *Rhinolophus luctus*, *Hipposideros ater*, *Hipposideros bicolor*, *Myotis muricola*, *Myotis ater*, *Pipistrellus vondermanni* and *Kerivoula pellucida*. With these additional records, there are now at least 34 species of bats known to occur in Bako National Park. A complete and long term study covering other areas not included in this study would definitely increase bats diversity found in this park.

Keywords: Bako National Park, bats, new record, diversity.

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INTRODUCTION

There are at least 92 species from eight families of bats (Chiroptera) documented in Borneo (Payne *et al.*, 1985). Bats surveys have been conducted by various researchers (Davis, 1958; Medway, 1959, 1977; Lim, 1965; Lim *et al.*, 1972; Start, 1972b, 1975;

Francis, 1989b, 1990, 1994; Hall, 1996; Hall *et al.*, 2004) and they have improved the current knowledge of bats diversity in Sarawak. This was further explored by Nor (1996, 1997), Yasuma and Andau (1999) and Tuen *et al.* (2002a, 2002b) who conducted their studies in Sabah, whereas Abdullah *et al.* (1997b) and Mohd-Azlan *et al.* (2003) conducted studies in the Indonesian-Kalimantan province. Recently, several researchers have actively documented the distribution of bats particularly in Sarawak in order to understand the species richness and their diversity (Abdullah *et al.*, 1997a; Abdullah *et al.*, 2000a; Hall *et al.*, 2002, 2004; Abdullah, 2003b; Abdullah *et al.*, 2003; Gumal *et al.*, 2004; Karim *et al.*, 2004; Tuen *et al.*, 2004; Mohd-Azlan *et al.*, 2005; Abdullah *et al.*, 2005; Jayaraj *et al.*, 2005a; and, Anwarali *et al.*, 2006). These studies were mainly focused on national parks and State forests where the habitats are less disturbed. Subsequently more new locality records were added every year showing better trapping efforts and improved batting techniques. In parallel, this study has also focused on improving our understanding on bat species diversity in protected areas of Sarawak by extensive sampling effort at different habitats and incorporating proper batting techniques (*e.g.*, harp traps and mist nets).

This study was designed to understand the importance of various vegetation types that contributes to bats species diversity and their composition within Bako National Park. Data from previous studies by Start (1972a), France *et al.* (1984), Churchill and Zborowski (1985) and Hall (1992) at Bako National Park were compared to show the species accumulation or reduction during different sampling occasions. We compile our checklist following Payne *et al.* (1985) and Simmons (2005) taxonomic nomenclature.

MATERIALS AND METHOD

STUDY AREA

This study was conducted in Bako National Park which is located at Muara Tebas Peninsula on the north-eastern part of Kuching, about 37 kilometres away from Kuching city. The main

access to the park is by a 20-minute boat ride through Sungai Delima. Bako National Park, the oldest national park of Sarawak, was gazetted as a protected area on 1st May 1957. This park consists of seven different major habitats: heath forest, mangrove forest, mixed dipterocarp forest, riverine forest, beach forest, grassland and cliff vegetation, which provides diverse ecological niches for high species richness and diversity of fauna (Hazebroek and Abang Kashim, 2000). Besides these habitats, seasonal swamp forest are also found around this park, especially as the intermediate between beach and mixed dipterocarp forest during the monsoon season. The main attraction found in this park includes the Bornean endemic proboscis monkey (*Nasalis larvatus*), the endangered flying lemur (*Cynocephalus variegatus*), western tarsier (*Tarsius bancanus*), silvered langur (*Presbytis cristata*) and bearded pig (*Sus barbatus*), which could be observed near the park headquarters area. Such unique fauna is well supported by diverse vegetation found in this park that provides wide varieties of food sources and niches.

Bako National Park (1°42' to 1°44' N, 110°26' to 110°36' E) which covers an area of 2727 hectares (Fig. 1) is the smallest national park in Sarawak (Hazebroek and Abang Kashim, 2000). Survey was carried out using 10 standard mist-nets and three four-bank harp traps during the first trip from 8th to 12th February 2005 that accounted to 65 trapping-nights. During the second trip from 28th August to 3rd September 2005, 20 mist-nets and three four-bank harp traps were used that accounted to 161 trapping-nights. The total trapping-nights effort was calculated based on the number of mist-nets and harp traps used in both sampling occasions. Nets and traps were set up at Ulu Asam Trail, Delima Trail, Tanjung Sapi Trail and Telok Asam area that includes the pathway to the incinerator, representing five different habitats including beach, heath, mangrove, mixed dipterocarp and seasonal swamp forests of Bako National Park. The sampling sites are marked with white stars in Fig. 1.