

## BATS ROOST SITE PREFERENCES IN WIND CAVE NATURE RESERVE, BAU, SARAWAK

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### ABSTRACT

Roosting site plays a vital role in bats existence as it provides protection from predators and bad weather. Unfortunately, little is known about bats roost preferences in Malaysia. Therefore, this study was conducted to determine roosting preferences of cave dwelling bats in Wind Cave Nature Reserve (Wind Cave NR). Cave microclimate and physiological parameters that were analysed in this study include roost temperature, humidity, distance of the roosting site from the nearest cave entrance and the sound intensity at bat's roosting site. HOBO data logger was used for taking temperature and humidity level. Leica Disto D3 range finder was used to measure roost distance whereas sound intensity was recorded using Decibel Meter Version 1.6 application. There were ten species of bats from five families found roosting in Wind Cave NR. The Canonical Corresponding Analysis showed four groupings with  $p$ -value < 0.0001. We also presented the relationship between bats natural diet with its ability to cope with fluctuations in roost's microclimate. Cave physical parameters appeared to influence bats roost selection in respect to its body size and echolocation ability. Knowing these parameters helps in better understanding of roosting preferences that is important for conservation of cave bats in Malaysia.

**Key words:** cave-dwelling bats, cave physical parameters, conservation, microclimate, roost site

### INTRODUCTION

Bats are classified under order Chiroptera which is the second most species group after order Rodentia (Anita & Altringham, 2008). They have wide distribution across the world not only due to their ability to fly, but also due to their diverse feeding guild, roosting habits, social behaviour and reproductive strategies. In Malaysia, there are about 125 species of bats from 13 families that primarily fall into either frugivorous, nectarivorous or insectivorous (Payne *et al.*, 1985; Simmons, 2005; Francis, 2008). Our tropical rainforest relies heavily on these bats as they provide vital ecological interactions. They pollinate flowers, disperse seeds and control insect population where all these activities contribute towards forest regeneration and ecosystem dynamics (Heithaus, 1982; Fleming, 1988; Charles-Dominique, 1991). However, most of

these bats may have their specific ecological requirement where they can play their role optimally. Therefore, bats can be sensitive towards any environmental disturbance particularly towards their roosting site (Kunz *et al.*, 1994).

Bats are homeothermic animals that need to enter torpor through the day (Kunz *et al.*, 1994). During torpor, they are being fuelled by metabolic processes to maintain their core body temperature, which is quite costly thus they tend to have a narrow tolerance limit towards the fluctuation of microclimates at their roosting site (Wijayanti, 2011). Roosting at appropriate microclimate can minimise energetic costs related to thermo-regulation, food digestion and assimilation (Medellin *et al.*, 2004). A study done by Wijayanti (2011) at 12 caves in Central Java shows that *Cynopterus brachyotis*, *C. horsfieldii*, *Eonycteris spelaea* and *Rousettus amplexicaudatus* roost at hot and dry roost ( $\geq 28.5^{\circ}\text{C}$ ;  $\leq 65\%$ ) whereas *Hipposideros ater* and *Rhinolophus borneensis* roost

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