

A Phylogenetic Relationship of *Rhinolophus* and *Hipposideros* in Malaysia Using Partial Mitochondrial DNA Cytochrome *b* Gene Sequences

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Abstract

A study on the phylogenetic relationship between 10 species of *Rhinolophus* and nine species of *Hipposideros* was conducted using specimens from Borneo and Peninsular Malaysia, including representatives from *Megaderma* and *Nycteris* as the outgroups. About 450bp length of mtDNA *cyt b* gene was amplified in polymerase chain reaction (PCR) and purified PCR products were subsequently sequenced and aligned. Of the 404 nucleotides position examined, the conserved sites accounted are 59.41% while 31.93% are parsimoniously informative. The phylogenetic tree reconstruction using neighbour-joining and maximum parsimony methods show separation between the two families. However, the interspecific relationship within *Hipposideros* is still unresolved. In general, the phylogenetic analysis using partial mtDNA *cyt b* gene is useful to show the genetic relationship between selected microchiropterans in this study.

Keywords: *Rhinolophus*, *Hipposideros*, phylogenetic relationship, cytochrome *b*, mtDNA

Introduction

Bats are the only mammals in the order Chiroptera that capable of true flight from where their forelimbs were specifically modified into wings (Payne *et al.*, 1985; Vaughan, 1986; Martin *et al.*, 2001). Chiropterans were ranked as the second largest group of mammals after the rodents (Eisenberg, 1981; Vaughan, 1986; Corbet and Hill, 1992). Generally, they are divided into two suborders, namely the Megachiroptera; the Old World fruit bats and the Microchiroptera; the predominantly insectivorous bats (Corbet and Hill, 1992; Hutson *et al.*, 2001, Simmons, 2005). Rhinolophidae and Hipposideridae that belong to the suborder Microchiroptera are widely distributed throughout the tropics, subtropics and temperate zones of the Old World region. Currently, there are 77 species of Rhinolophidae with only one genus described whereas 81 species from nine genera in Hipposideridae were recorded.

Up to date, 16 *Rhinolophus* species are recorded in Malaysia where only 10 species considered in this study. They are *R. philippinensis*, *R. sedulus*, *R. trifoliatu*s, *R. luctus*, *R. creaghi*, *R. acuminatus*, *R. pusillus*, *R. borneensis*, *R. steno* and *R. affinis* (Payne *et al.*, 1985; Corbet and Hill, 1992; Khan *et al.*, 1992, Yoshiyuki and Lim, 2005). Generally, the rhinolophids are small to medium in size, having an elaborate complex noseleaf and a raised portion called sella that is very useful for identification among the species of this genus (Payne *et al.*, 1985; Corbet and Hill, 1992). The ears are sorted from moderate to large sized with a moderate long tail that is completely enclosed within their interfemoral membrane (Payne *et al.*, 1985; Vaughan, 1986; Corbet and Hill, 1992).