
Short Communication

A new distributional record of the rare bat *Coelops robinsoni* from Sarawak, Malaysian Borneo**M.R. Abd Rahman^{1*}, Anang Setiawan Achmadi^{1,2}, Roberta Chaya Tawie Tingga¹ and Noor Haliza Hasan¹**

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ABSTRACT. A specimen of the rare Lesser Tailless Roundleaf Bat, *Coelops robinsoni* was caught at the mouth of Lobang Gan Kira, one of the entrances to Niah Cave, Niah National Park (NNP) on 15th November 2008. This bat is a new record for the park and only the third record for Malaysian Borneo, the previous records being from the Deer Cave, Mulu and Sarawak Planted Forest Zone (SPFZ), Bintulu Division. Detailed descriptions of the external morphology, skull and dentition are presented. Additional individuals of this species may occur in the cave as a potential roosting site was found on the cave ceiling approximately six meters above the floor and 300m from the entrance. More information on this bat is crucial for immediate and effective conservation plans as this species is listed as vulnerable by the IUCN.

Keywords: *Coelops robinsoni*, Niah National Park, Borneo.

INTRODUCTION

The Genus *Coelops* is classified under the family Hipposideridae in the suborder Microchiroptera. This genus is comprised of two species, *Coelops frithi* and *C. robinsoni*

(Corbet & Hill, 1992; Nowak, 1994; Francis, 2008). *Coelops robinsoni* or the Lesser Tailless Roundleaf Bat is a very small bat which has long and soft fur. The fur colouration is brown to blackish on the dorsal surface and ashy on the ventral surface. It can be distinguished from the other roundleaf bats by its small size and the absence of the tail. The distribution of this bat is restricted to the Southeast Asian region from Peninsular Thailand, Peninsular Malaysia to Borneo and possibly to the Philippines (Payne *et al.*, 1985; Francis, 2008).

This species was first described from a specimen collected in Malaysia by Bonhote (1908) from the foot of Mount Tahan, Pahang. This was followed by Tate (1941) from the specimen collected on the Archbold expeditions which descriptions resemble *C. robinsoni* even though it was slightly smaller than the type specimen. Throughout Borneo, there are only two records for this distinctive little bat, but no measurements are available. The first record of this bat in Borneo was from the Deer Cave, Mulu National Park (Cranbrook, 1984) and the second record was from the Sarawak Planted Forest Area (SPFZ), Bintulu Division (Mead, 2007).

In Thailand, this species is known to form small colonies inhabiting caves and is considered a rare species (Lekagul & McNeely, 1977). In Peninsular Malaysia, the species has been recorded roosting in a cave and in the hollow buttress of a tree and shares its roosting site with *Hipposideros ridleyi* (Kingston *et al.*, 2006; Francis, 2008). In Philippines, this species was previously known as *C. hirsutus* and recorded only from Mindoro Island (Nowak, 1994; Wilson & Reeder, 2005). However, Hill (1972) suggested that *C. hirsutus* was a conspecific species of *C. robinsoni*. Until now, the ecology and habitat preference is still poorly known, due mainly to the species being difficult to catch. Throughout its distribution, it is not known whether the small number of specimens is due to low population numbers or due to a high level of traps and net avoidance due to a combination of flight pattern and sensitive echolocation.

The distribution of this species is poorly known and its population is considered declining due to loss of lowland forests (Francis, 2008). It is listed as vulnerable by the IUCN (Heaney, 2008), thus more information on the species is crucial for immediate and concise conservation plans. This paper presents a new distributional record and observations on *C. robinsoni* in Borneo.

MATERIALS AND METHODS

A survey was conducted in the vicinity of Lobang Gan Kira, Niah National Park (N 03° 48.208' E113° 45.68') between 15th to 19th November 2008 to determine bat diversity in the area (Abd Rahman, 2010). Ten standard mist nets were placed at the selected area in the limestone forest. Two four bank harp traps were set at the mouth of the cave and another one was located in a nearby closed canopy limestone forest. The nets and harp traps were repeatedly checked from 1830 hours and remained open until 0630 hours.

The external body and skull measurements were taken using a dial vernier calliper (Mitutoyo™, Kawasaki Japan) and body weight using a Pesola™ spring balance. A total of 32 measurements were recorded for the specimen. Fifteen external body and wing measurements were taken prior to skull extraction. Seventeen skull and dental parameters were measured and recorded. The bat was preserved as a wet specimen in 95% ethanol and deposited in the Museum of Zoological UNIMAS. A tissue sample was preserved in both lysis buffer and 95% ethanol. A list of the measured parameters were as follows; FA – forearm length; EAR – ear length; TB – tibia length; HF – hind foot length; HB – head body length; WT – weight; D2MCL – second digit metacarpal length; D3MCL – third digit metacarpal length; D3P1L – third digit first phalanx length; D3P2L – third digit second phalanx length; D4MCL – fourth digit metacarpal length; D4P1L – fourth digit first phalanx length; D4P2L – fourth digit second phalanx length; D5MCL – fifth digit metacarpal length; D5P1L – fifth digit first phalanx length; D5P2L – fifth digit second phalanx length; GSL – great skull length; IOW – interorbital width; CW – cranial width; MW – mastoid width; ZW – zygomatic width; PL – palatal length; PPL – post palatal length; BL – bulla length; DBC – distance between cochleae; GBPL – great basal pit length; DL – dental length; C1BW – first canine breadth width; C1C1B – breadth across both canine outside surfaces; M3M3B – breadth across both third molar teeth outside surfaces; C1M3L – canine molar length or maxillary tooth row length; M2L – second molar tooth crown length; and M2W – second molar tooth crown width.

RESULTS AND DISCUSSIONS

An adult male *C. robinsoni* was captured on 15th November 2008 in a harp trap set up near the mouth of Lobang Gan Kira, Niah National Park, Sarawak (Figure 1). The bat was found in

a trap at 0630 hours. The area is surrounded by limestone habitat. Other species of bats caught in the vicinity during the survey were *Nycteris tragata*, *Myotis horsfieldi*, *Hipposideros galeritus*, *Balionycteris maculata*, and *Cynopterus brachyotis*.

The specimen had a forearm length of 35.88 mm and the fur was dark brown and ashy in colour with pale tips. The ears were short and rounded with no tragus (Figure 2). The eyes were not visible and were covered by long hair. Only the noseleaf and its rostrum were visible. The tail was absent as were any frontal sacs or lateral leaflets. The intermediate leaf was characterised by a narrow eminence of the median ridge, settled under the posterior

leaf. The anterior leaf was deeply notched, parting the lateral leaflet into two portions of overlapped wide and rounded lobes with two layers. The outer lobes were covered the inner lobes and the inner lobes were extended forward, farther than the outer ones. This arrangement is congruent with those observed by Tate (1941). The skull characters of *C. robinsoni* in the current study also match with those described by Tate (1941). A most obvious character was the inflation of the rostral area of the skull, along with a flat nasal portion. The braincase of the specimen was short and rounded and the zygomata were short with the absence of a jugal eminence. The canine was highly prodont, along with cingulum cusps. Also the W-pattern of the third molar (M3)

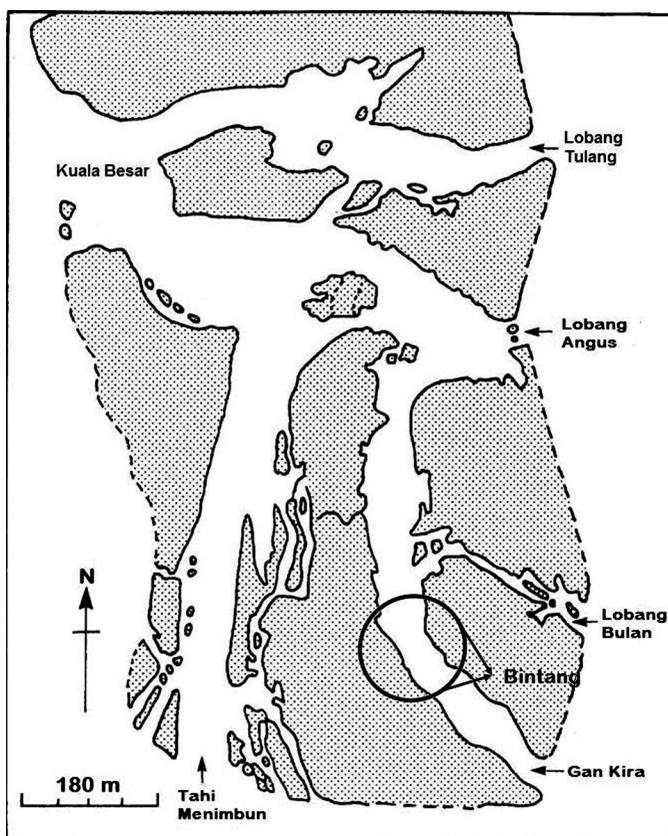


Figure 1. The Bintang site in Niah Cave, Niah National Park. Map adapted and modified from Majid (1982).



Figure 2. The male tailless roundleaf bat, *Coelops robinsoni* caught in Niah National Park.

was virtually complete in the specimen, as described by Tate (1941). The measurements of the Niah specimen are presented in Table 1 along with the available information from the other two *C. robinsoni* records from Borneo.

Coelops robinsoni is a new species record for Niah National Park which was previously listed by Hall *et al.* (2002). The first Borneo specimen of *C. robinsoni* was a dead male found on the floor of Deer Cave, Mulu in Sarawak (Hill, 1983; Cranbrook, 1984; Payne *et al.*, 1985). Several measurements of this specimen were recorded as the bat was partially mummified. In January 2007, an individual was recorded at SPFZ, Bintulu by Kris Helgen (Mead, 2007) (Figure 3). This second record was caught in a harp trap. However, no measurements or any specific information regarding the bat or the locality are available. According to Hill (1972), *C. robinsoni* is considered rare in collection because it is difficult to catch and its taxonomic status seems unclear. This species is similar to

the Greater Tailless Roundleaf Bat *C. frithi* which is much larger in size. The lower lobes of noseleaf are lengthened and narrow. This close relative of *C. robinsoni* has never been discovered in Borneo and is known to be widely distributed from eastern India to southeastern China, northern Indochina, Taiwan, Peninsular Malaysia, Java and Bali (Nowak, 1994; Payne *et al.*, 1985).

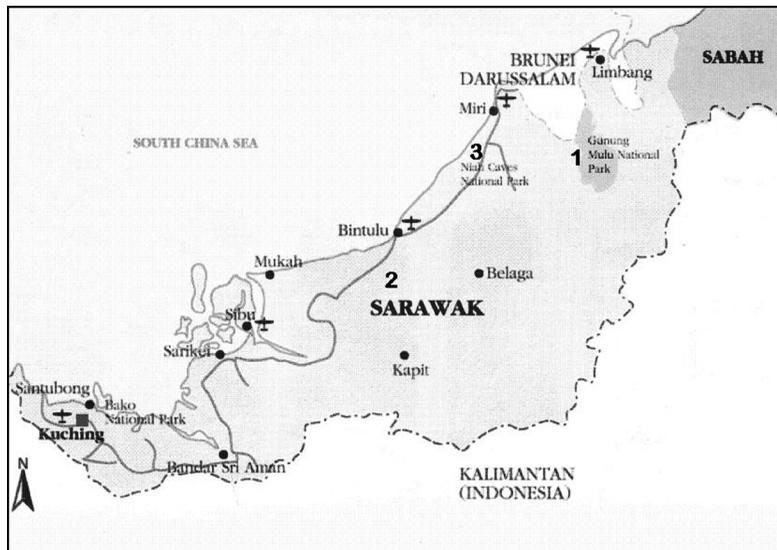
Coelops robinsoni is known to roost solitarily (Allen, 1928). It is suggested that this species may roost deep inside caves as during a transect through Niah Cave, *C. robinsoni* was observed to use Bintang Chamber, approximately 300m from the entrance (Figure 1), as its roosting site which was approximately 6 meters above the cave floor. The record from Deer Cave, Mulu was a specimen found on the floor of the cave a long way from the entrance (Cranbrook, 1984). It is possible that guano mining and bird-nest collecting activities, which occur in Niah Cave, may be two of the major threats to this species. Sensitivity to environment changes and predators could also contribute to declining numbers of individuals or colonies.

The record of this specimen and the two previous records suggest that the distribution of *C. robinsoni* is only on dense forests in the eastern part of Sarawak, and two of these records are from very large caves. Thus, it is suggested that this species might have preference for big caves located in limestone areas in dense forests. The current distribution also might be a result of the increasing loss of lowland habitats. Further studies on the echolocation calls of this bat will enable detection of this species using a bat detector within a cave. This would allow the detection of roost sites within caves and lessen the need of trapping and reducing stress to the bat caused by catching and handling.

Table 1. Body, wing dimension and skull measurement in mm and weighting.

Parameters	Present study n=1♂	Kingston <i>et al.</i> (2006) n=3♂2♀*	Payne <i>et al.</i> (1985) n=2*	Cranbrook (1984) n=1♂
FA	35.88	34.2-36.4	34.0 – 37.0	36.5
EAR	13.36	13.5-15.0	12.0 – 14.0	-
TB	13.76	15.0-16.5	-	-
HF	5.25	-	-	-
HB	35.63	-	-	-
WT	2.50	3.0-4.0	-	-
D2MCL	31.10	-	-	-
D3MCL	21.81	-	-	-
D3P1L	6.79	-	-	-
D3P2L	18.33	-	-	-
D4MCL	24.84	-	-	-
D4P1L	7.72	-	-	-
D4P2L	8.96	-	-	-
D5MCL	29.28	-	-	-
D5P1L	8.79	-	-	-
D5P2L	11.39	-	-	-
GSL	13.90	-	-	-
IOW	3.90	-	-	-
CW	6.42	-	-	-
MW	5.74	-	-	-
ZW	5.73	-	-	-
PL	3.08	-	-	-
PPL	6.13	-	-	-
DBC	3.17	-	-	-
BL	2.73	-	-	-
GBPL	3.78	-	-	-
DL	9.00	-	-	-
C1BW	0.76	-	-	-
C1C1B	2.80	-	-	-
M3M3B	4.87	-	-	-
C1M3L	5.04	-	4.7	5.0
M2L	1.11	-	-	-
M2W	0.98	-	-	-

*Peninsular Malaysia specimens.

**Figure 3.** Maps indicate the localities of new distributional record of the *C. robinsoni* around Sarawak, Malaysian-Borneo (1) Mulu National Park; (2) Sarawak Plantation Forest Zone, and (3) Niah National Park. Map adapted from http://www.malaysiamap.org/map_directory/tourismmalaysia/maps/map-sarawak.gif.

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