

Short Note

First confirmed records of *Taphozous longimanus* and *Myotis annamiticus* (Chiroptera) from Lao PDR

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In 2009, a single male *Taphozous longimanus* was collected in Champasak Province, Southern Lao PDR. This locality is situated close to those known from Cambodia and north-east Thailand (Fig. 1) and represents the first confirmed record of this species from Lao PDR, although it had been included previously in some country checklists but was subsequently omitted for lack of supporting data^{1,3}.

Additionally, in 2012, four specimens of *Myotis annamiticus* were collected in the upper reaches of the Nam (river) Hinboun in the Khammouan Limestone National Biodiversity Conservation Area (NBCA), Central Lao PDR. This species was described from central Vietnam⁴ and was included later for Lao PDR². However, it was subsequently omitted for lack of supporting data³. The new locality in Lao PDR is the first outside Vietnam. It is situated close to the type (and only known) locality in the Annamite Mountains of Vietnam (Fig. 1).

Measurements

In this study, five voucher specimens were measured. They are held in the collection of the Faculty of Environmental

Sciences, National University of Laos, Lao PDR (FES).

Measurements were taken with a digital caliper, except for body mass which is taken with a Pesola spring balance⁵. They included: **HB**: head and body length – from the tip of the snout to the anus, ventrally; **FA**: forearm length – from the extremity of the elbow to the extremity of the carpus with the wings folded; **EL**: ear length – from the lower border of the extremity of the auditory meatus to the tip of the pinna; **TL**: tail length – from the tip of the tail to its base adjacent to the anus; **HF**: foot length – from the extremity of the heel behind the os calcis to the extremity of the longest digit, not including the hairs or claws; **TIB**: tibia length – from the knee joint to the extremity of the heel behind the os calcis; **3MT**, **4MT**, **5MT**: third, fourth, fifth metacarpal lengths, respectively – from the extremity of the carpus to the distal extremity of the third, fourth and fifth metacarpals respectively; **3D1P**, **3D2P**, **4D1P**, **4D2P**: first and second phalanges of third and fourth digits, respectively – from the proximal to the distal extremity of the phalanges; **3D1Px100/3MT** – % length of first phalanx of third digit relative to its

metacarpal; **W**: body mass (in g); **GTL**: greatest length of the skull – the greatest antero-posterior diameter of the skull, from the most projecting point at each extremity regardless of what structure forms these points; **CCL**: condylo-canine length – from the exoccipital condyle to the anterior alveolus of the canine; **CBL**: condylo-basal length – from the exoccipital condyle to the alveolus of the anterior of the anterior incisor; **MW**: mastoid width – the greatest distance across the mastoid region; **ZB**: zygomatic breadth – the greatest breadth of the skull across the zygomata; **BB**: breadth

of the braincase – width of the braincase at the posterior roots of the zygomatic arches; **PC**: postorbital constriction – the narrowest width across the constriction posterior to the orbits; **ML**: mandible length – from the most posterior part of the condyle to the most anterior part of the mandible, including the lower incisors; **C¹-C¹**: anterior palatal width – taken across the outer borders of the upper canine; **M³-M³**: posterior palatal width – taken across the outer borders of the third upper molar; **C-M³**: upper tooththrow length – from the front of the upper canine to the back of the crown of the third upper

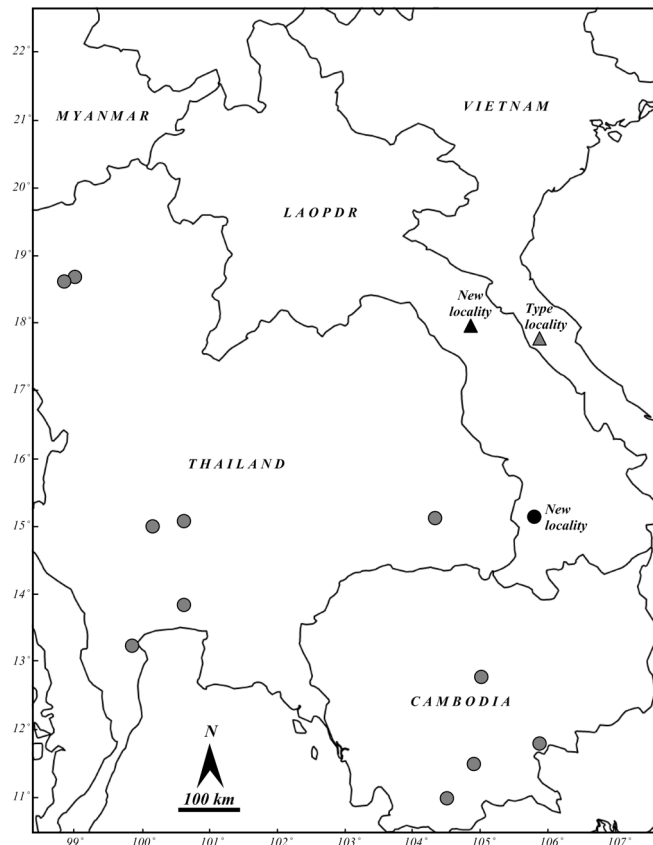


FIGURE 1. Distribution map of *Taphozous longimanus* (circles) and *Myotis annamiticus* (triangles). Black symbols represent the new localities in Lao PDR and grey symbols are the localities from the literature for Thailand²¹, Cambodia^{22,23} and Vietnam⁴.

TABLE 1. External, cranial and dental measurements (in mm) and body mass (in g) of *Taphozous longimanus* and *Myotis annamiticus* from Lao PDR.

Character	<i>T. longimanus</i> ^a	<i>M. annamiticus</i> ^b	
		Min–Max	Mean ± SD
HB	70.9	35.9–39.5	37.3 ± 1.5
FA	59.5	33.0–34.5	33.8 ± 0.6
EL	18.8	12.1–15.0	13.5 ± 1.2
TL	26.2	32.3–35.7	34.4 ± 1.5
HF	13.4	7.2–8.2	7.9 ± 0.5
TIB	25.1	14.4–15.8	15.2 ± 0.6
3MT	57.4	31.0–32.0	31.4 ± 0.5
4MT	46.0	30.1–31.0	30.6 ± 0.4
5MT	35.9	29.3–30.9	29.9 ± 0.7
3D1P	21.2	10.6–12.2	11.7 ± 0.7
3D2P	21.8	8.6–9.6	9.2 ± 0.4
4D1P	11.9	8.1–9.0	8.6 ± 0.4
4D2P	8.1	6.0–7.0	6.5 ± 0.5
3D1Px100/3MT	37.0	32.9–39.1	36.9 ± 2.9
W	-	4.0–4.5	4.1 ± 0.4
GTL	-	12.6–13.6	13.2 ± 0.4
CCL	19.7	11.1–11.8	11.5 ± 0.3
CBL	-	11.9–12.6	12.2 ± 0.3
MW	10.5	6.7–7.0	6.8 ± 0.1
ZB	12.3	7.4–7.6	7.5 ± 0.1
BB	10.0	6.2–6.8	6.6 ± 0.3
PC	5.1	3.1–3.4	3.2 ± 0.1
ML	15.7	8.8–9.5	9.2 ± 0.3
C ¹ -C ¹	3.8	3.0–3.3	3.2 ± 0.2
M ³ -M ³	8.6	5.1–5.2	5.1 ± 0.1
C-M ³	8.9	4.7–5.0	4.9 ± 0.1
C-M ₃	9.8	4.9–5.3	5.2 ± 0.2

^{a,b} Measurements are based upon ^aone (male) *T. longimanus* and ^bfour (one male and three females) *M. annamiticus*.

molar; **C-M₃**: lower toothrow length – from the front of the lower canine to the back of the crown of the third lower molar.

SYSTEMATIC DESCRIPTIONS

Taphozous longimanus Hardwicke 1825

Long-winged Tomb Bat

Taphozous longimanus Hardwicke⁶; Calcutta, India.

New Material

FES.MM.09.002, ♂, Nakhouang Village, Sanasomboun District, Champasak Province, Lao PDR (15°11'16"N, 105°43'17"E, 105 m above mean sea level (amsll)).

Descriptive Characters

The single male specimen has a forearm length of 59.5 mm (Table 1). The chin, which has a large gular sac, is essentially naked. In

the wing, the fourth metacarpal exceeds the fifth in length, but is shorter than the third. The third metacarpal is 96.5% the length of the relatively long forearm. The wing membranes are attached to the tibia. The skull is relatively small with a condylo-canine length of 19.7 mm (Table 1) and is typical of the genus (Fig. 2). The length of the upper toothrow (C-M³) is 8.9 mm.

Distribution and Ecology

Taphozous longimanus was included as 'Lower Risk, least concern' in the IUCN Red List⁷. Its distribution in Lao PDR (one new locality) is mapped in Fig. 1 along with the previously recorded locations in Thailand and Cambodia. It was found roosting in the roof of a house.



FIGURE 2. Lateral, dorsal and ventral views of the skull of *Taphozous longimanus*, FES.MM.09.002, ♂, Ban Nakhouang, Sanasomboon District, Champasak Province, Lao PDR. Scale: 5 mm.

***Myotis annamiticus* Kruskop and Tsytsulina 2001**

Annamite *Myotis*

Myotis annamiticus Kruskop and Tsytsulina⁴; Yen Hop valley, near Yen Hop, ca. 35 km South Minh Hoa (Qui Dat), Minh Hoa district, Quau Binh Province, Vietnam.

New Material

FES.MM.12.121-124, 1♂, 3♀, upper reaches of the Nam (river) Hinboun, 3–4 km north of Ban Tha Khankeo, Khammouan Limestone NBCA, Khammouan Province, Lao PDR (17°59'36"N, 104°49'23"E, 184 m amsl).

Descriptive Characters

The four *Myotis annamiticus* (1♂, 3♀) from Lao PDR have an average forearm length of 33.8 mm (33.0–34.5 mm; Table 1). The upperparts are brown; the hair bases

are dark. The underparts are grey-brown with dark bases to the hairs. The ears are long and narrow with a rounded tip. The tragus is long and slender with blunt tip and a basal lobe. The muzzle is short with a short nostril and some short hairs (Fig. 3A). In the wings, the fourth metacarpal exceeds the length of the fifth, but is shorter than the third. The first phalanx of the third digit is short, between 32.9–39.1% the length of the relatively long third metacarpal. The wing membrane is attached to the side of the foot, about 1–2 mm from the toes (Fig. 3B). The feet are enlarged, about 7.2–8.2 mm.

The skull has an average condylo-canine length of 11.5 mm (11.1–11.8 mm). The mastoid width is 6.7–7.0 mm, which is narrower than the breadth of the zygomata (Table 1). When viewed in lateral profile, the skull has a bulbous braincase, with the parietal region similar in height to the



FIGURE 3. Face (A), FES.MM.12.123, ♀; and wing attachment (B), FES.MM.12.124, ♀; of *Myotis annamiticus*, upper Nam (river) Hinboun, Khammouan Limestone NBCA, Khammouan Province, Lao PDR.

frontal region; the anterior part of the braincase slopes forward to the rostrum (Fig. 4). The rostrum is narrow and relatively long with a narrow depression in the middle. The sagittal crest is absent. Each zygoma is very narrow on both anterior and posterior parts. The length of the upper tooththrow ($C-M^3$) averages of 4.9 mm (4.7–5.0 mm). The upper canine (C^1) is small and slightly exceeds the height of the third upper

premolar (P^4). The second upper premolar (P^3) is small, about half the height of the first upper premolar (P^2), and compressed in the tooththrow. The lower canine (C_1) is small, equal in height to the third lower premolar (P_4). The second lower premolar (P_3) is small, about one half the height of the first lower premolar (P_2) and is compressed in the tooththrow.

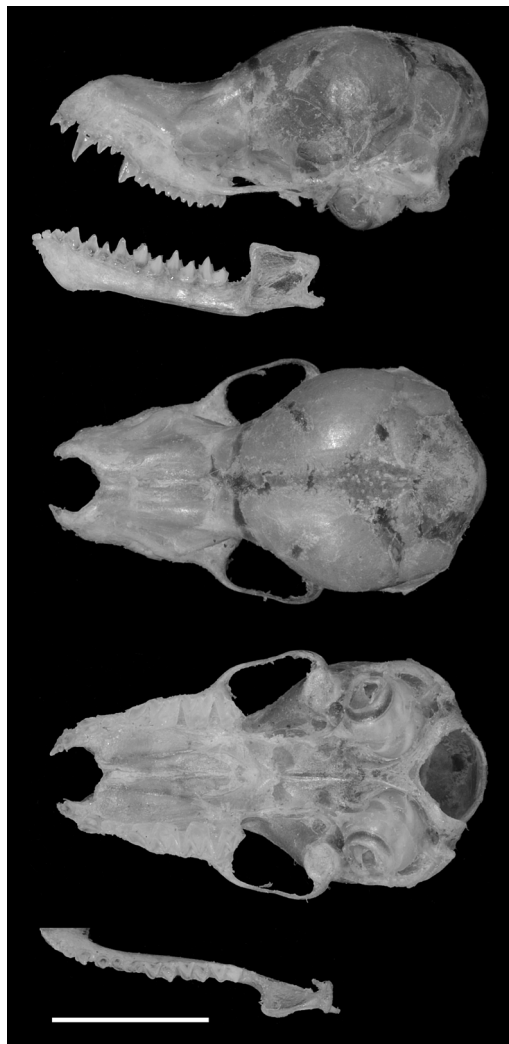


FIGURE 4. Lateral, dorsal and ventral views of the skull of *Myotis annamiticus*, FES.MM.12.122, ♀, upper Nam (river) Hinboun, Khammouan Limestone NBCA, Khammouan Province, Lao PDR. Scale: 5 mm.

Conservation Status and Distribution

Myotis annamiticus was included as 'Data Deficient' in the IUCN Red List⁸ based on the fact that it was only known from the vicinity of the type locality. It is now known from both Vietnam and Lao PDR^{2,4,8-9} (Fig. 1). In Lao PDR, it was collected in a harp trap set on a natural trail in lowland evergreen forest at the base of a limestone outcrop, adjacent to a river and fields. Lactating females were found in late May and early June.

The records of *T. longimanus* and *M. annamiticus* from Lao PDR increase the number of bat species known from the country to 92 and support a previous report that additional field studies would discover further bat species within the country¹. The record of *T. longimanus* from outside an NBCA confirms the value of undertaking research both within and outside protected areas. It is probable that *M. annamiticus* is more widespread than currently thought, especially in the Annamite Mountain range, which is a 'hotspot' for endemic, rare species. In recent years, many new species of mammals^{10,14}, birds^{15,16} and amphibians^{17,20} have been discovered in this region. We suggest that further surveys should be conducted in this and nearby areas, such as in Nakai-Namtheun and Hin Nam No NBCAs.

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