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New distribution records of *Tadarida aegyptiaca* E. Geoffroy, 1818 (Mammalia: Chiroptera: Molossidae) from Karnataka, India

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Abstract

The Egyptian free-tailed bat has so far been recorded only from two sites in Karnataka. The present study gives additional distribution records of the species from Bellary and Raichur districts based on voucher specimens. The bacular morphology of the male of the species is also discussed.

Keywords: Egyptian free-tailed bat, Raichur, Bellary, range extension

1. Introduction

The Family Molossidae consists of 13 genera and 89 species ^[1] belonging to the order Microchiroptera. These are small or medium sized insectivorous bats with strong tail projecting beyond the interfemoral membrane, and prominently wrinkled lip. They are distributed throughout old World and New World tropics ^[2]. India is home to three species of wrinkle-lipped bats belonging to three genera ^[3]. Of these, the genus *Tadarida* is represented by two species namely *Tadarida teniotis* and *Tadarida aegyptiaca* period. The Egyptian free-tailed bat *Tadarida aegyptiaca* (E. Geoffroy, 1818) differs from the European free-tailed bat *Tadarida teniotis* (Rafinesque, 1814) in having a distinctly smaller forearm (46.0-52.3 vs 58.4-63.9 mm) and possessing ears separated on the forehead.

During a recent survey conducted in Raichur and Bellary districts of Karnataka, India to document the bat diversity, we came across colonies of the Egyptian free-tailed bat *Tadarida aegyptiaca* (E. Geoffroy, 1818) (Fig. 1) in crevices among large boulders on hills and between the gaps of pillars of ancient temples.

The Egyptian free-tailed bat is known to roost in caves, crevices and buildings ^[4-8], under stone slabs on hills ^[9-11], under banner boards ^[12-14], and narrow cracks and spaces in pillars ^[15-16].



Fig 1: *Tadarida aegyptiaca* at the roost in Raichur district, Karnataka

2. Materials and Methods

In Raichur district, while exploring a hill adjacent to the Raichur fort we observed a colony of 10-15 individuals of bats among crevices in large boulders on the hill. One of the individuals was collected, preserved in alcohol and deposited in the Natural History Museum, Osmania University (NHM.OU.CHI.K28.2014). In Hampi, Bellary district while exploring an old temple we observed individuals of bats under a banner and in the gaps between the pillars (Fig. 1). The pillars were very high and inaccessible, however, we could upon much trying capture one specimen from under a wooden banner located at the entrance of the temple. The specimen was collected, preserved and deposited at the Natural history Museum, Osmania University (NHM.OU.CHI.K61.2014) for further studies both the collected specimens were male individuals.

Photographs of the specimens were taken and the specimens were identified as *Tadarida aegyptiaca* [17-18]. Skulls were extracted from the preserved specimens and external and craniodental measurements of the specimens were taken with the help of a digital vernier caliper (Mitutoyo make) to the nearest mm (Table 1). Baculum from the male specimen collected in Raichur was extracted by immersing the penis in 5% potassium hydroxide, staining with alizarin red followed by microdissection of the penis and preservation of the baculum in glycerol.

3. Results and Discussions

The Egyptian free-tailed bat is a medium sized bat with a strong tail projected outwards beyond the interfemoral membrane. Ears are not joined over the forehead. Feet are hairy, but wing membranes are hairless. Dorsal coat colour dark brown and paler ventrally. The braincase is smooth, broad and flattened, which suits their habitat where they are found. No sagittal crest is present. When examining the dentition, it was observed that the present specimen had two pairs of incisors in the mandible and in the maxilla the first upper premolar (pm²) was present in the tooth row and was minute in size in comparison to the second upper premolar (pm⁴) (Fig. 2). Due to this a wide gap was observed between the canine and the second upper premolar (pm⁴) contrary to earlier studies where the gap between the two was narrow as the first upper premolar was extruded from the tooth row [17].



Fig 2: Skull of *Tadarida aegyptiaca* from Raichur district, Karnataka

The baculum structure (Fig. 3A, B, C) observed differed from that provided by Agrawal and Sinha [19] in being dumb-bell shaped with the proximal end narrowing and the distal end being distinctly forked. Additionally, the region between the distal and the proximal parts was narrow, almost 'neck-like' (Fig. 3A, B, C). The baculum structure outlined by Agrawal and Sinha [19] is that of *Tadarida aegyptiaca thomasi* and further studies on the taxon *gossei* which is presently synonymised under *Tadarida aegyptiaca* and is known from Pune, Maharashtra, might clarify the status of the southern and central Indian population of *T. aegyptiaca*.

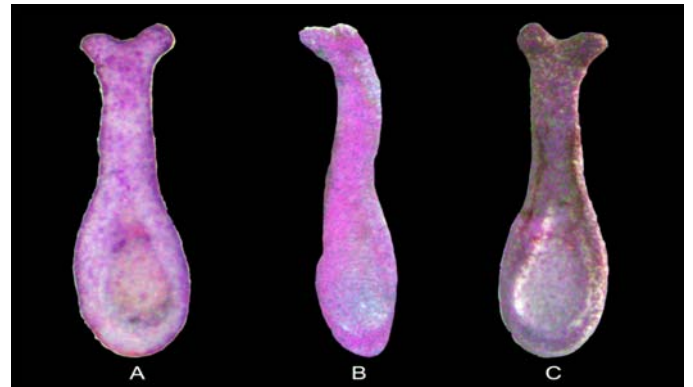


Fig 3: Baculum of *Tadarida aegyptiaca* from Raichur district, Karnataka A. Dorsal view; B. Lateral view; C. Ventral view

Table 1: External and cranio-dental measurements of voucher specimens of Egyptian free-tailed bat (in mm)

	External			Craniodental	
	NHM.OU.C HI.K28.2014	NHM.OU.C HI.K28.2014		NHM.OU.C HI.K28.2014	NHM.OU.C HI.K28.2014
FA	47.48	49.18	GTL	18.94	20.47
HB	69.05	70.78	CBL	18.98	20.11
E	17.34	17.76	CCL	17.92	18.80
Tl	44.59	43.10	ZB	17.45	12.32
Hf	7.07	6.93	BB	10.01	10.54
Tib	13.10	15.56	C-M ³	7.40	7.75
			C-M ₃	8.30	8.15
			C ¹ -C ¹	4.50	4.85
			M ³ -M ³	8.12	8.56
			M	13.10	14.04

Key: FA: Forearm length; HB: Head and Body length; E: Ear length; Tl: Tail length; Hf: Hind foot length; Tib: Length of the tibia; GTL: Greatest length of skull; CBL: Condyllo-basal length; CCL: Condyllo-canine length; ZB: Zygomatic breadth; BB: Breadth of braincase; CM³: Maxillary tooththrow; C¹-C¹: Anterior palatal width; M³-M³: Posterior palatal width; CM₃: Mandibular tooththrow; M: Mandible length.

4. Conclusion

The Egyptian free-tailed bat is endemic to south Asia being known from Afghanistan, Bangladesh, India, Pakistan and Sri Lanka^[3] In India, this species has been reported from Andhra Pradesh, Rajasthan, Gujarat, Maharashtra, Karnataka, Kerala, Tamil Nadu, Madhya Pradesh and West Bengal^[2, 13, 20, 17, 3]. In Karnataka, this species is known from Kolar^[21] and Dharwar districts^[16] apart from these two localities this species has not been reported from elsewhere in Karnataka. We, through this communication, give new distribution localities of this species from Hampi, Bellary district and Raichur, Raichur district, Karnataka and suggest that this species might be widely distributed than is presently known. Additionally, our study indicates that the Egyptian free-tailed bat from the peninsular India are distinct from that of northern and western India, owing to the bacular morphology, and the nomen *Tadarida aegyptiaca gosseii* could be resurrected and applied to the peninsular India forms henceforth.

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