

## Mating Behavior and Habitat Preference of *Taphozous longimanus* (Chiroptera) in Bangladesh

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### Abstract

This study explains mating behavior and nesting preference of *Taphozous longimanus*. The mean copulation duration ( $\bar{x}$ ) was 6.17 minutes and mean copulation interval ( $\bar{x}$ ) was 10.50 minutes. *T. longimanus* always found to live in close association of 5 to 16 individuals. The species were found to roost in unused loft, room and crack on wall where light does not reach. Total seven houses were marked as roosting place all of which were more than 20 years old in same village.

**Keywords:** Chiroptera; Mating behavior; Habitat preference

### Introduction

Bangladesh is a biodiversity rich country located at the junction of the Indo-Himalayan and Indo-Chinese sub-regions [1] and also a part of Indo-Burma biodiversity hotspot [2]. A total of 33 species of bats belonging to nine families are known to found in Bangladesh [4] of which, *T. longimanus* belong to the Family: *Emballonuridae* [3]. This is a small sized bat with head to body length of 78.3 mm, forearm and tail length of 59.2 mm and 24.4 mm respectively [4]. Pelage of the species is short and soft with fur on the dorsal aspect of body extended on to wing membranes for about half the length of each humerus and femur [5]. Body colour varies from cinnamon-brown to reddish-brown to black and belly tends to be lighter brown than the back. Females are usually darker than the males [5]. *T. longimanus* are known to associate with coconut and other palm, old tomb, monuments and crevices in building and wall as well as in tree hollows [6]. Individuals of both sexes use to live together from October to June but the sexes segregate in the non-breeding season, July to September, when females roost in a large unisexual colonies and male individuals live in a small unisexual groups [7]. They breed from January to May and second pregnancy terminating in August [7].

It is an uncommon but widely distributed species in Bangladesh [3]. There is no previous report of mating behavior and habitat preference of this species from Bangladesh. In this article, we report our observations mating behavior and habitat preference of *T. longimanus* for Bangladesh.

### Methods

Observation was carried out over visual encounter with naked eyes and the observation time was around 2030 h to 0200 h with a total of 5.3 hours. A torch light was used to get clear view and a Canon SX 50 HS camera for taking photographs. Mating time was counted by using stopwatch of windows cell phone. Identification of *T. longimanus* was determined by good quality photographs (body color, size, shape of

mouth and lips and wing diameter) following help from Indian bat expert Dr. Srinivasulu Chelmalala.

### Study area

During field work at night, we have opportunistically got a mating pair of *T. longimanus* on 19 July 2015 at Patiamli village, Patnitala sub-district under Naogaon district. The village is geographically located at 25°6' 6.57" N, 88°49' 7.03" E and elevation around 85 ft asl (Figure 1).

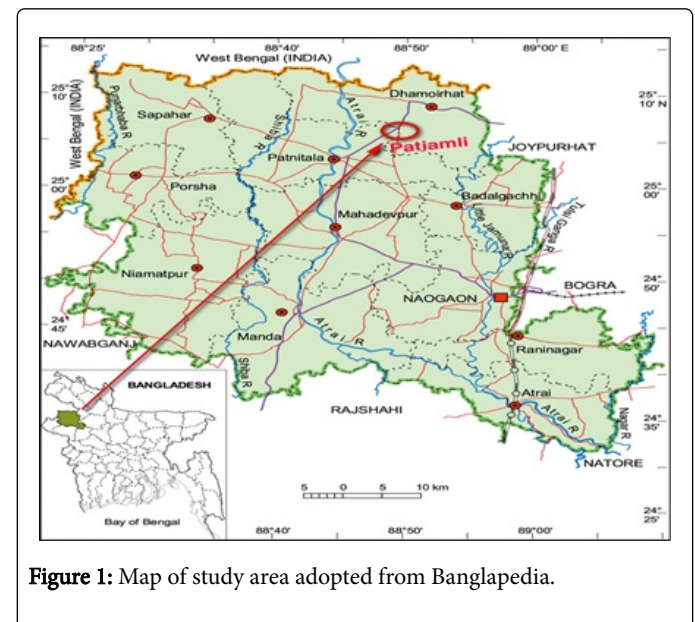


Figure 1: Map of study area adopted from Banglapedia.

### Result and Discussion

We observed the mating pair of *T. longimanus* on the outer wall of a tin-shed two storied soil made house. House was about 24 ft. high and the pair was close to the top roof. Later, we found another two mating pairs between 19 and 22 July at different locations, both of which were

two storied soil made houses. However, mating data were collected from only one mating pair, which was observed earlier.

Copulation number	Copulation start time	Copulation end time	Interval (minute)	Duration (minute)
1st	08.23 pm	08.27 pm	-	4
2nd	08.40 pm	08.43 pm	13	3
3rd	08.52 pm	08.53 pm	9	1
4th	09.11 pm	09.17 pm	18	6
5th	09.24 pm	09.29 pm	7	5
6th	09.45 pm	10.03 pm	16	18
* $\bar{x}$ =Sample mean			$\bar{x}$ =10.50	$\bar{x}$ =6.17

**Table 1:** Copulation duration of a mating pair of *T. longimanus* of a single night.

During the observation, male individual moved sidewise following the female as a courtship behavior prior mating (Figure 2). It was also repeated during mating intervals on occasion. Some notable behaviour during mating were male taking place on the dorsal side of female, sudden vibration of tails by the air and pulling up faces by their wing pushing on dorsal side of female (Figure 3). Copulation occurred six times within 82 minutes (Table 1). The maximum copulation interval was recorded in 4th copulation with time duration of 16 minutes and maximum copulation duration was in 6th copulation with time duration of 18 minutes. The minimum duration of copulation interval were recorded in 5th copulation number with time duration of 7 minutes and minimum copulation duration were recorded in 3rd copulation number with time duration of only 1 minute. The mean copulation interval ( $\bar{x}$ ) was 10.50 minutes and the mean copulation duration ( $\bar{x}$ ) was 6.17 minutes. After the last copulation, the male left the copulation site and the female was seen to rest in the mating place for the rest of the observation time.



**Figure 2:** Courtship behavior of *T. longimanus*.



**Figure 3:** Mating of *T. longimanus*.

Habitat preference of *T. longimanus* was under observation from 7 October 2014 to 25 July 2015. They were found to roost in unused loft, room and crack on wall where light does not reach. Total seven houses were marked as roosting place all of which were more than 20 years old. We did not get any individual at any single storied house or at brick built house or in any tree hole. Notably, these bats were not even found in any distempered and plastered house. They were always found to live in close association of 5 to 16 individuals and each group was maintained by an aged individual. Usually the aged individual was larger in size and some fur become grey or whitish due to age (Figure 4). The members of each group were found to follow the direction of group leader whenever they felt insecure. They never changed their roosting place during the study period. A new born was seen to remain attached to its mother by its wings on the ventral side throughout the study period (Figure 5).



**Figure 4:** Roosting of *T. longimanus* inside of a unused loft and group leader larger in size showing whitish fur.



**Figure 5:** A new born remains attached to its mother by its wings on the ventral side.

The primary threats were identified as the conversion of soil made house to brick built house. Another threat was plastering and distemping soil made houses, which is not suitable for *T. longimanus*. Besides, local people consider bat as a nuisance element having negative myths, therefore, are usually not eager for bat conservation. Urgent measures are needed to protect the bats from fast decaling in Bangladesh. Some of the last remaining old soil made houses need to be kept aside from converting to brick built houses, so does from plastering and distemping. There is an urgent need for making the public aware of the beneficial aspects of all the bats and removing the century old misconceptions about them. In addition, further extensive studies are needed to determine the ecology of *T. longimanus* in Bangladesh [8].

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