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Population fluctuation at Indian Flying Fox (*Pteropus giganteus*) colonies in the Kacharighat Roosting Site of Dhubri district of Assam

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ABSTRACT

*The **Indian Flying Fox (Pteropus giganteus)** is a species of flying fox of the Pteropodidae family under the suborder Megachiroptera. It is one of the largest fruit bat species found in the Indian subcontinent. They have one to two young. This bat is gregarious and roosts in colonies which can number up to 1,000 individuals, during the day. Due to various anthropogenic and environmental causes their populations are declining alarmingly. Current study has been aimed to know the population and its fluctuation in the **"Kacharighat Roosting Site"** of Dhubri town area of Assam. "Direct roost count" method was followed to estimate the population size of the colony. Observations were mostly done with the naked eyes. All total four roosting spots were identified in the roosting site. Highest population was recorded at 775 in the site. Total population of the roosting site was ranged between 720 and 775 during the study. Average population of the site was recorded at 735 no. of bats. Spot wise fluctuations were very minimal and the population at the Kacharighat Roosting site was more or less stable during pre-monsoon.*

Key words: *Indian flying fox, Pteropus giganteus, population, Fluctuation, Assam.*

INTRODUCTION

Nancy Simmons[10] of the American Museum of Natural History reported a new total of at least 1,293 living bat species during the recent International Bat Research Conference (IBRC) in Costa Rica. That's more than 20 percent of all mammal species. Bats are true flying mammals in the globe. There are also other mammals in the globe that have the flight skin development, like the flying lemurs, flying squirrels, flying marsupials; but their flight travel is only a short distance, downwardly, almost like a gliding jump. So, it cannot be termed as an actual flight like that of the bats. As per standard classification the bats belong to the order "Chiroptera" meaning hand – winged, as forelimbs are modified into simple wings. The order Chiroptera is again subdivided into two suborders, "Megachiroptera" (known as the Old World fruit bats) and Microchiroptera which include all the insectivore and carnivore bats. The suborder Megachiroptera is represented by a single family called "Pteropodidae". Old World fruit bats (Megachiropterans) are restricted to the Old World tropics and subtropics and are almost exclusively phytophagous.

The **Indian flying fox (*Pteropus giganteus*)** is a species of Flying Fox of the Pteropodidae family. The Indian flying fox locally known as Pholkhowa Borbaduli (Frugivorous; big bat) in Assamese, Borobadur in Bengali and Samgadar in Hindi[1]. It is one of the largest fruit bat species found in the Indian subcontinent stretching from Bangladesh, China, India, the Maldives, Nepal, Pakistan to Sri Lanka. Ecologically fruit bats are highly important species as they are one of the best pollinators and seed dispersers in tropical forests throughout the world[5,8,9].

This helps in maintaining forest diversity as well as forest regeneration[4]. It is nocturnal and feeds mainly on ripe fruits such as figs, mangoes bananas, and flower nectar. At dusk, these bats forage for ripe fruit. While ingesting fruit, these bats expel waste; by this mean they disperse seeds in their foraging areas. They are mammals and have live births. Their offspring have no specific name besides 'young'. They have one to two young. This bat is gregarious and roosts in colonies which can number up to 1,000 individuals, during the day. Due to various anthropogenic and environmental causes their populations are declining and they are going to be extinct in the near future. So proper measures in terms of awareness drive and habitat conservation is to be taken for rapid population growth. With this very aim, this short study has been planned to know the population and its fluctuation in the **"Kacharighat Roosting Site"** of Dhubri town area.

Taxonomic Position of Indian Flying Fox:

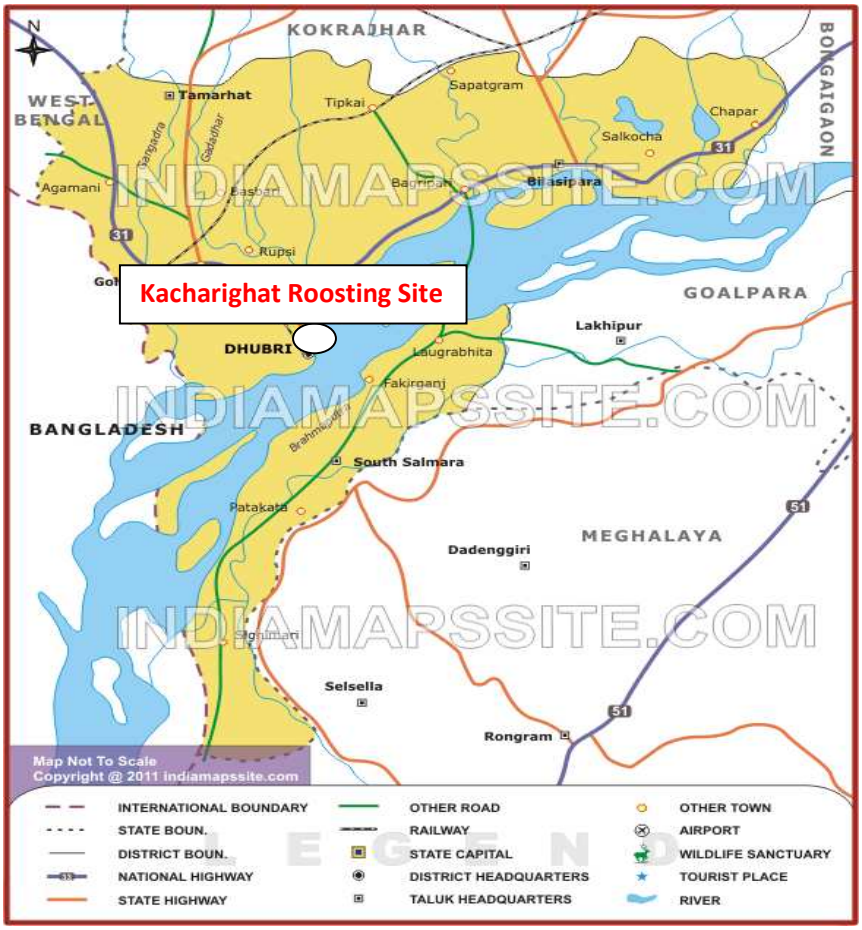
Kingdom – Animalia
Phylum – Chordata
Subphylum – Vertebrata
Super class – Tetrapoda
Class – Mammalia
Subclass – Theria
Infraclass – Eutheria
Order – Chiroptera
Suborder – Megachiroptera
Family – Pteropodidae
Subfamily – Pteropinae
Genus – *Pteropus*
Species – *Pteropus giganteus* (Brunn.)

Type species*:* *Vespertilio gigantea* Brunnich, 1782
Type locality: Bengal, India.

STUDY AREA AND CLIMATE

Study was conducted at the Kacharighat Roosting site of Dhubri district of Assam. It is very significant that the roosting site of Indian Flying Fox is situated in the main town of Dhubri. Dhubri District is the gateway of Western Assam. Dhubri District is bounded both by inter-state and international border i.e. West Bengal and Bangladesh in the West, Goalpara and Bongaigaon district of Assam and Garo Hills district of Meghalaya in the east, Kokrajhar district in the North, Bangladesh and state of Meghalaya in the south. Covering an area of 2,838 Sq. Kms. Including forests, riverine, hills etc. the district has become the most densely populated district in India with a density of 397 per sq km. (As per 2011 census). The beautiful heritage Bunglow for DC and DFO are situated on the bank of river Brahmaputra just a furlong away from the District Court Building. These areas are occupied by two roosting spot of *Pteropus giganteus*. Another roosting spot was located at near the DC Office building. This district is located on the globe between 89.42 to 90.12 degree east longitude and 26.22 to 25.28 degree north latitude. The district is situated at 30 meters above the sea level on average. General topography of Dhubri district is plain with patches of small hillocks like Tokorabandha, Dudhnath, Chandardinga, Boukumari, Boropahar, Chakrasila etc. All these are situated in the north eastern part of the district. Mighty river Brahmaputra is flowing through this district from east to west with its tributaries like Champabati, Gourang, Gadadhar, Gangadhar, Tipkai, Sankosh, Silai, Jinjiram etc. According to Mani[7], the vegetation of Assam is mostly dominated by tropical semi-evergreen, moist deciduous and subtropical mixed forest types. But Champion and Seth[3] reported that there are six different types of forest like, Sub Himalaya's high alluvial semi evergreen forests, Eastern Bhabar Sal forests, East Himalayan moist mixed deciduous forest, Eastern wet alluvial grasslands. Low alluvial savannah woodlands and Assam valley semi-evergreen forests. General climatic condition of the Dhubri was found to be muggy characterised by the presence of moderate temperature and high humidity.

Fig 1: Map of Dhubri showing the Kacharighat roosting site



MATERIALS AND METHOD

To elucidate the population size of the Indian Flying Foxes (*Pteropus giganteus*) at various roosting spots of the Kacharighat roosting site, bats were counted in every Sunday starting from 09.03.2014 to 25.05.2014 at the morning hours after sunrise during the Pre-Monsoon season. **"Direct roost count"** method was followed to estimate the population size of the colony[2]. Observations were mostly done with the naked eyes. Depending on the need, help of a Russian Binocular (Pathiscope, de Luxe ; Field-10×50) was taken to spot out the hiding bats. Canopy cover and tree heights were qualitatively measured. Girths at Breast Heights (GBH) of the roosting trees were taken with the help of a 150 cm measuring tape.

RESULTS AND DISCUSSION

In the present study, during the entire study period, four roosting spots such as Spot-A, Spot-B, Spot-C and Spot-D of Indian Flying Foxes (*Pteropus giganteus*) could be identified in the Kacharighat roosting site of Dhubri district of Assam. Ecological details of all the four spots along with their weekly population data are shown in the Table-1 and Table-2. A highest population of 775 was recorded on 4.5.2014. Except for the dates 23/3/2014 and 4/5/2014, on the other survey dates, there were no major fluctuations seen in the population groups of Indian Flying Foxes at the different spots of Kacharighat roosting site. Total population of the roosting site was ranged from 720 to 775 during the entire study period. Average no. of bats in the spots A, B. C. and D were evaluated as 575, 83, 65 & 12 respectively. Spot 'A' emerged as the largest population group in the roosting site. The no. of bats in the Spot 'A' always exceeded than the other three spots throughout the study period. Average population of the site was recorded at 735 no. of bats.

Table 1: Roosting spots with their ecological details

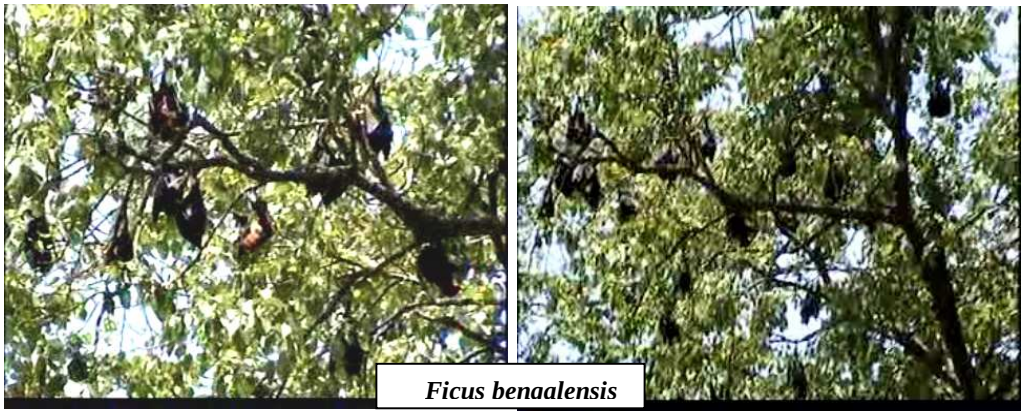
SPOTS	SPOT – A (Near Dak Banglow)	SPOT - B (Near Dak Banglow Gate)	SPOT – C (Inside the official Residense of DC)	SPOT – D (Near the gate of DC office)
Local Name	Bot	Mango Tree	Krishnasura	Mango Tree
Scientific Name	*Ficus bengalensis*	*Mangifera indica*	*Delonix regia*	*Mangifera indica*
G. B. H.	900 cm	150 cm	130 cm	150 cm
Canopy Cover	Dense	Dense	Light	Dense
Height of tree	59 feet	39 feet	46 feet	49 feet

Table 2: No. of Bats/spots showing the weekly fluctuation in the roosting site

Sl. Nos.	Survey Date	SPOT - A	SPOT - B	SPOT - C	SPOT - D	TOTAL
1	9/3/2014	535	87	103	12	737
2	16/3/2014	500	135	80	9	724
3	23/3/2014	640	85	25	5	755
4	6/4/2014	725	0	0	5	730
5	13/4/2014	625	75	25	14	739
6	20/4/2014	560	105	40	20	725
7	27/4/2014	620	100	0	0	720
8	4/5/2014	550	97	103	25	775
9	18/5/2014	525	90	100	14	729
10	25/5/2014	520	92	103	15	730
	Average	**575**	**83**	**65**	**12**	**735**

As the fluctuations in the weekly populations were minimal so it can be concluded that populations of Indian flying fox colonies at the Kacharighat Roosting site during pre-monsson season happens to be more or less stable**.** Still we need this kind of study for a complete year covering all the climatic seasons for final interpretation and therefore we recommend more and more population related study for proper understanding of the population regime of the site which in turn will give us the holistic overview on the population status of *Pteropus giganteus* in Assam.

Some Roosting Trees:



CONCLUSION

In the current conditions of the environment, 700 above average population of a site means a healthy population. As the site is completely situated under anthropogenic habitat, we need to take of the site and more and more awareness programmes are necessary for the conservation of the species. In future the site can be declared as a "Bat Park" with consultation with the higher forest authority of the state.

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