

A colony of Fruit bat (*Pteropus giganteus*) in Thane city, Maharashtra.



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Abstract : Fruit bat (*Pteropus giganteus*) has a wide distribution in India and play important role in pollination and seed dispersal. A colony of bats of nearly 1000 such bats were observed in Thane city near Cadbury chowk. Thane is also a city of lakes and lake revival has been undertaken by the concerned authorities. Small lakes can possibly be revived through voluntary participation. About 52% area is under green cover and forest. Sustainable development will be helpful not only for bats and other species but also for human beings.

KEYWORDS : Fruit bat, Conservation, Green cover, lake revival

Introduction

Fruit bat (*Pteropus giganteus*) is a member of family Pteropodinae of Order Chiroptera. It has a wide distribution in India including Andaman Islands (Wilson and Reeder, 1993 and is listed in CITES in Appendix- II (www.CITES.org). There have been reports on occurrence of *P. giganteus* on earlier occasions. (Korad *et al.*, 2007, Gaikwad *et al.*, 2012). Fruit bats play important role such as that of pollination and seed dispersal for a wide variety of plants (Fleming and Estrada, 1996; Banack, 1998; Shilton *et al.* 1999; Godinez-Alvarez *et al.* 2002). Several plants which are dependent on Old World Fruit Bats for their propagation have economic important (Fujita and Tuttle, 1991). It is the largest fruit bat and the largest flying mammal in India. It has also been mentioned that it is a sacred species in India (Vedan, 2003).

Study area

Thane city is a growing and populated sub-urban area near Mumbai and is a famous city with lakes. Thane city is a part of Mumbai Metropolitan Region. It is the administrative headquarter of Thane district. Thane is the first urban center on the outskirts of Greater Mumbai and therefore, has a unique position in the region. Topographically, Thane is separated from the mainland by the Ulhas estuary and the Thane creek and it is connected through reclaimed land with the island city of Mumbai. The city is surrounded by hills. Due to its topography, there are many lakes in and around the Thane city; there are 30 lakes within the city limits of Thane. Upvan lake is a large lake near Cadbury chowk near the present study location of fruit bats (*P. giganteus*). The present study reports a colony of fruit bats in Thane city near Cadbury chowk and makes an attempt to address the conservation of bats with some of the development issues. Some of the geographical features and climatic conditions are given in Table 1-

Table 1. Some of the geographical features and climatic conditions of Thane city

Latitude and Longitude of Thane city	19 degree 12' N & 73 degree 02 ' E
Altitude (MSL)	7 m
Terrain	Hills towards the west and submersible marsh land along the Thane creek on the south-east and Ulhas river bank towards the north.
Climate	Coastal, hot and humid
Annual average rainfall	2500mm
Maximum Temperature	35-40 degree C
Minimum Temperature	25-35 degree C
Area of town	128 Sq Km (approx)
Population	1,261,517 (Census, 2011)

(Source : Thane Environmental Status Report for Thane Municipal Corporation For Maharashtra Pollution Control Board, March 2010, www.emccentre.com)

Methods

Bats were observed and counted on two consecutive days. A physical count was made for bats where possible or estimated as accurately as possible. Information about Thane has been taken from secondary sources.

Results

Observations were made on bat colony on two consecutive days in February 2014. Bats were found hung on 9 trees ; on one large tree an estimated 200-220 bats were present during the day time while on remaining 8 trees, an estimated number of 100 to 110 bats were observed. Some of the tree canopies were overlapping as well. The tree height was nearly 35-40 feet. The bat colony was on a side road with an estimated 200- 250 feet distance from the main road. Krystufek (2009) reports that Peradeniya Botanical Gardens near Kandy in Sri Lanka is possibly the largest known aggregation of Indian flying fox at present.

The total area under the corporation is 12823 Ha. Major land use category in Thane Municipal Corporation is under forest and green zone. Together, they constitute 52% of the total within administrative boundaries. Thane has coast on the western side and Mangroves also fall under the green zone .

Discussion

The population growth of Thane over 50 years is almost double than that of Maharashtra state (Table1) (Census Survey of India, Thane Environmental Status Report for Thane Municipal Corporation For Maharashtra Pollution Control Board , March 2010 , www.emccentre.com and Directorate of Economics and Statistics, Government of Maharashtra) . It may be concluded that this has occurred due to movement of people from other areas into Thane (in-migration) rather than natural growth of population . On the other hand, it is to be noted that bats usually have one young one in a year. Effective breeding population and recruitment are considered important for conservation of species (Welbergen, 2008) . Besides, in fringed myotis (*Myotis thysanodes*), lactating bat females also require more water (Adams and Hayes, 2008) . Water conservation in and around Thane city will be of crucial significance for bat conservation. Fortunately, Thane city has good rainfall (Table 1) , so water can be easily harvested. Conservation of water in various lakes in and around Thane and other resources will be helpful for bat conservation. Thane Municipal Corporation in association with Ministry of Environment & Forests has undertaken lake revival programme of some lakes on BoT (Built, Operate and Transfer) basis. However, small lakes are not feasible to outsource through BoT mechanisms as their commercial potential is not much (Thane Municipal Corporation – City Development Plan). Such small lakes can possibly be revived through voluntary mechanisms. Besides, continuous tree line and hedgerow provides connectivity of landscape for bats commuting between foraging sites, so by maintaining the area on a sustainable basis –

- (i) Loss of suitable habitat can be avoided as well as avoid loss of connectivity between habitats.
- (ii) Avoid fragmentation and isolation of habitats.
- (iii) Protect potential roots sites such as old trees, buildings and bridges near suitable foraging habitats.

Their guano and bolus are also important for habitats as natural organic manures e.g. Phosphorus in guano and bolus has been found to be higher than in cow and sheep manure , thus showing their value as natural manure to meet phosphorus requirements of plants (Govias *et al.*,2006).

The bat population can be monitored periodically. The exponential population growth can be expressed as –

$$N = N_0 e^{rt}$$

N_0 = Number in initial population

r = growth rate (decimal value, defined as percentage increase in population over a period of time)

t = length of time

N = Number in final population (Principles of population growth, www.waynesword.palomar.edu/lmexer9.htm)

Conclusion

Sustainable development will not only help in conservation of bats and other species but will also help in reducing human-leopard conflict in nearby Sanjay Gandhi National Park in Borivilli. According to Millennium Assessment (2005), damages to ecosystems, affects the welfare of human beings (www.millenniumassessment.org/documents/document.356.aspx.pdf) ,therefore, sustainable development of Thane will be a task of human welfare.

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