

Observation on Electrocution of Indian Flying Fox (*Pteropus Giganteus*) in Ramganjmandi, Kota, (Rajasthan) and their Conservation Strategies

Rohit Chouhan¹, Surbhi Shrivastava²

¹Wildlife Research fellow, Department of Wildlife Science, University of Kota, Kota, India

²Coordinator, Department of Wildlife Science, University of Kota, Kota, India

Abstract: An observational study was done on death of Indian flying foxes (*Pteropus giganteus*) due to electrocution. The survey was carried out from 2017 to 2018 at Ramaganjmandi (24.6496° N, 75.9434° E), Kota, Rajasthan. We observed 13 dead and injured individuals on electricity line causing electrocution. Present study suggests to cover up the power lines with plastic coated tubes situated on the resting trees of animals or increase the distance between two power lines to minimize mortality of flying fox.

Keywords: Electrocution, bats, Indian Flying Fox (*Pteropus giganteus*), Ramganjmandi, conservation measurements.

1. Introduction

Bats are the regenerators of the forest and a key component of biodiversity, however, the fruit bats are listed in schedule V of the Indian Wildlife Protection Act in India (1972). Bats are widely distributed. Fruit bats are useful to humans in pollinating several plants and they also play a great role in pest-control (Bats, P.J.J.2013). In India, *Pteropus* comprises five large fruit bats of which the Indian flying fox is in the mainland and the other four are in Andaman and Nicobar Islands. Total nine species of Family, *Pteropodidae* found in all over country. The *Pteropus giganteus* (Brunnich, 1782), the flying fox is threatened by the habitat loss due to cutting of native trees for the construction of roads and houses (Molur, S. et al, 2008). This affects biodiversity and the population of the species and it may become the cause of decline in some species (Molur, S. at all 1998). Other threats include hunting for meat in some areas and for medicinal use (Molur, S. et al 2008), agricultural

development, industrial development and increased human population (Huston, A.M 2002). One of the major threats include electrocution.

Death of fruit bat due to Electrocution is reported (Molur, S. et al in Madikeri coorg district. The Electrocution accidents are dependent on animals' body size and perching and roosting behavior (S. Rajeshkumar, at al Andaman and Nicobar 2013). The present study is the first report from Ramganjmandi about mortality of flying fox (*Pteropus giganteus*) due to Electrocution from here. The city of stone, Ramganjmandi, (24.6496° N, 75.9434° E) is located in Kota as a sub-district of 144 villages.

Regular visual surveys conducted at Ramganjmandi, Kota Rajasthan from 2017 to 2018, and a total 13 individuals of flying foxes were found electrocuted in power lines in mostly around same places in Ramganjmandi (Table 1). Most of the electrocuted bats were observed on electric power lines that passes through the resting trees. We collected one dead specimen of *Pteropus giganteus* from the Mall Godam, Ramganjmandi for taking morphometric measurements which is shown as follows. Forearm length (FA) 158 mm, Head Body length (HBL) 272mm, Hind Foot length (HF) 62 mm, Ear length (E) 20 mm, Tibia length (TIB) 73 mm, Thumb (Including Claw) 57 mm, 3rd Metacarpal 81 mm, 1st Phalange 17 mm, 2nd Phalange 64 mm, and Wing span (WSP) 538 mm, Weight 121 g.

Due to power lines, electrocution is a common problem for

Table 1
 Electrocuted flying fox *Pteropus giganteus* observed in Ramganjmandi

Place and forest division	Co-ordinates	Date of observation	No of deaths
1. Mall Godam	N24°38.838' / E075°56.485'	4/08/2017	2
2. Sabji mandi	N 24°38.756' / E075°56.771'	27/08/2017	1
3. Railway colony	N24°38.761' / E075°56.459'	30/08/2017	2
4. Mall Godam ground	N 24°38.839' / E075°56.494'	02/09/2017	1
5. Kairabad Road	N 24°39.237' / E075°56.113'	30/09/2017	1
6. Mall Godam Chowki	N 24°38.845' / E 075°56.459'	20/12/2017	2
7.Mall godam	N 24°38.845' / E 075°56.459'	17/05/2018	2
8.Gordhanpura	N 24°38.492' /E075°56.291'	11/08/2018	1
9. Satal Kheri	N 24°39.291' /E76°00.330'	22/12/2018	1

large body sized fruit bats. Bats go for searching food at night and during this daily migration, collision with high-power lines which are mostly located between roosting and foraging sites cause death and injury to these flying mammals.

When bats stretch their large wings between two power lines while hanging on these power lines, the circuit gets completed and electrocution occurs. According to Kjetil Bevanger (1997), occasionally bat survive electrocution, but badly injured flying-foxes will not be able to fly and will remain on the ground. Rayner (1988) applied principal component analysis to wing morphology and derived statistically independent measures of size and wing proportions in birds.

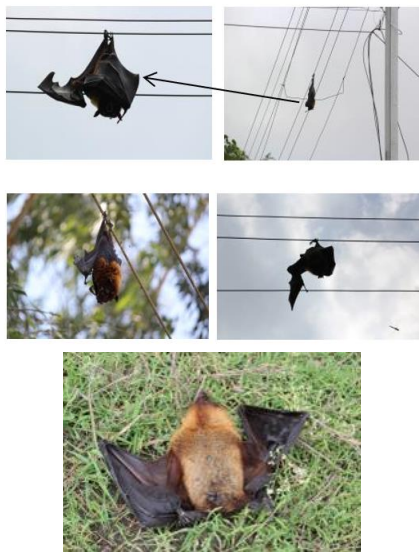


Fig. 1. Individuals of Electrocuted flying fox at Ramganjmandi



Fig. 2. Power line at Ramganjmandi is covered up with plastic coated tubes to prevent electrocution

Likewise Flying foxes (Megachiropterans) have a large wingspan that can be easily electrocuted on power lines, as the distance between power lines is about one meter. A study by Rajashkumar et al showed that microchiropterans having wingspan of less than one meter were not affected. Flying-foxes have a large wingspan (over 1 metre), but they are also excellent climbers using the clawed thumbs on the wrists of their wings. They will generally climb to move about in a tree once they

have landed. Unfortunately, this gets them into trouble on overhead power lines. The power lines also resemble open branches for the bats to rest on. Usually they will be electrocuted when they reach for the next "branch".

A similar conclusion by Bernard Agwanda – A Bat Specialist, was that the size of the bat wing span range between 10cm and 60cm. To minimize this risk on the transmission line, overhead power cables should be spaced sufficiently wide (>60cm), more than the size of wingspan of the largest bat known or suspected to use the given area. Where this is not possible, insulation may be considered, every year high tension power lines are responsible for thousands of cruel injuries with slow and painful deaths to bats and other flying animals.

In urban environment, power lines are still being erected along with railway lines, in car parks and industrial estates and most of it are also planted with wildlife attracting native plants. Present study suggests power lines should be covered up with plastic coated tubes and the gap behind the power line should be increased to reduce the mortality rate of flying foxes by electrocution.

2. Conclusion

This paper presented an overview on observation on electrocution of Indian flying fox (*Pteropus Giganteus*) in Ramganjmandi, Kota, (Rajasthan) and their Conservation Strategies.

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