

### ON THE STATUS, ROOSTING AND FORAGING BEHAVIOR, THREATS OF PTEROPUS GIGANTEOUS GIGANTEOUS IN JASOL, BALOTRA DISTRICT BARMER, INDIA

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**ABSTRACT**

*Barmer is great biodiversity in Thar Desert. Roosting sites of Jasol (Balotra), megachiropteran species (Pteropus giganteous giganteous) first time explored, during survey time 2010-2013. In general Pteropus giganteous giganteous voice dislike by humans. Indian flying fox were habitually observed i.e sleeping, grooming, wing spreading and wing flapping at roosting site. Approximately 120 species of chiropteran fauna in india, out of which 14 species are megachiropteran (Pteropodidae) belongs to 8 genus and the left behind are insect-eating or microchiropteran species. Roosting sites of chiroptera provide conservation for mating, hibernation, rearing young, social interactions, digestion of food and offer protection from adverse weather and predators. In India, fruit bats are listed below Schedule V of the Indian Wildlife Protection Act, 1972 which is the only Schedule that carries no penalty or restriction at all for the killing or capturing of animals. Fruit-eating bats long distance of foraging movement play an extremely important role in ecosystem regeneration viz., pollination, seed dispersal, guano and keep on ecosystem symmetry. Chiropteran fauna are hunted for a variety of different reasons, including for bush meat consumption medicinal value, trade, recreation, and for the decorative and currency values of their teeth. Fire, pollution, and climate change also include in threat. After 2019, Refineries are developing in Pachpadera, Balotra. Then build up resources and changes in this area.*

**KEYWORDS:** *Pteropus giganteous giganteous; Roosting behavior; Foraging behavior; Threats; Balotra; Barmer.*

## INTRODUCTION

Order megachiroptera (Mammalia- *Pteropus giganteus giganteus*) is well deliberated as one of the largest chiroptera and is extensively spreaded in the Indian subcontinent and broadly disseminated from india, Nepal, Maldives, Bhutan, Bangladesh and Pakistan to Sri Lanka.<sup>[1]</sup> Chiroptera comes from the Greek roots cheiro (hand) and ptera (wing), named for the resemblance of a chiroptera wing to a hand. Chiropteran species (mega bats and microbats) wings are long arms, hands and extra-long finger bones that are covered with a double layer of thin skin called a membrane. Roosts provide sites for mating, hibernation and rearing young; they promote social interactions and the digestion of food; and they offer protection from adverse weather and predators.<sup>[2,3]</sup> General safeguarding behaviors such as wing fanning, wing stretching, grooming, locomotion, sleeping, urination and defecation were observed along with social behaviors including antagonistic vocal display, courting females and copulation.

Megachiroptera are frequently placed in close association with man and tend to be found in cities and villages. Megachiropteran species *Pteropus giganteus giganteus* individuals also roost in big and established trees and roosting sites are close association to pond and river, human residential area, government office campus, educational institutional campus, villages, cities etc. All species of *pteropodids* are thought to be generally phytophagous, frugivorous, floral resources (nectar and pollen), or leave with insects forming a small component. India is comparatively rich in chiroptera fauna comprising around 120 species, out of which 14 are frugivorous megachiroptera (belong to 8 genus) and the remaining are insectivorous microchiroptera.<sup>[4]</sup>

Indian flying fox, *Pteropus giganteus giganteus* considered as ‘Least Concern’ in International Union for Conservation of Nature (IUCN) Red List of Threatened Species (IUCN, 2017)<sup>[5]</sup> and appendix-II in Convention on International Trade in Endangered Species of Wild Fauna and Flora.<sup>[6,5]</sup> *Pteropodids* long-distance foraging movements<sup>[7,8]</sup> play central role in ecosystem regeneration i.e. spreading of seed and pollinating of flower<sup>[9]</sup> Guano from chiropteran species used as fertilizer on agricultural crops due to its high concentrations of limiting nutrients like nitrogen and phosphorous. Its nightly foraging habitat, colony size diverse according to food availability, roosting preference observed in thick foliage for sun or rain protection.<sup>[10]</sup>

Threats for the survival of fruit bat, *Pteropus giganteus giganteus* included loss of wild fruits urbanization, development projects, decorative values, cutting down of roost trees, slaughter for meat, anthropogenic activity, medicinal value and habitat destruction.<sup>[11,12,13]</sup>

## EXPERIMENTAL

### Materials

### Study area

This study was conducted in and around Barmer city, covering Jasol (25°50'39"N Latitude 72°15'06" E Longitude), Balotra (Fig.1).

### Methods

The direct roost count methods<sup>[14]</sup> were used for the census of the Indian flying fox *Pteropus giganteus giganteus*. The Digital Minimum- Maximum Hygro thermometer were used to record microclimatic parameters viz., temperature, relative humidity and The Global positional system (GPS) was used.<sup>[15,16,17]</sup> Direct field observations were done to monitor the population and behaviour of the study species .Floral and faunal diversity were monitored for the habitat evaluation (Fig.2).

## RESULTS AND DISCUSSION

### Megachiroptera roosting sites

**Jasol** (25°50'39" N Latitude and 72°15'06"4" E Longitude)

During (2010-2013) survey first time found new roosting site of Megachiropteran species Indian flying fox (*Pteropus giganteus giganteus*) in Jasol. It is twenty km away from Balotra city, Barmer. Its ten kilometer away from Balotra (Fig.2). Jasol was explored for the first time in this investigation. No past study is available. *Pteropus giganteus giganteus* roost on the trees of Vilayati imeli (*Pithecellobium dulce*), Ashoka (*Saraca asoca*) and Neem (*Azadirachta indica*). *Pteropus giganteus giganteus* roosts were observed and recorded usually sited in larger trees such as the colonies of Indian flying fox generally located in closeness of water bodies, close association with human beings near villages. Fruit bat live solitary and some time also roosts very close to one another megachiroptera can be seen to touch their wings with each other. Some individuals may be seen quarreling with each other and quarreling megabat make a peculiar kind of vocalization (Fig.1). In winter temperature ranges between (25°-27°C) and Relative humidity (30-32%), Megabat (*Pteropus giganteus giganteus*) number increase. In summer temperature ranges between (40°-42°C) and Relative

humidity (30-40%), Megabat (*Pteropus giganteus giganteus*) number decreases (Text Fig.1 and Table.1).

**Table 1: Maximum and Minimum number of population *Pteropus giganteus giganteus* recorded in Jasol, Balotra.**

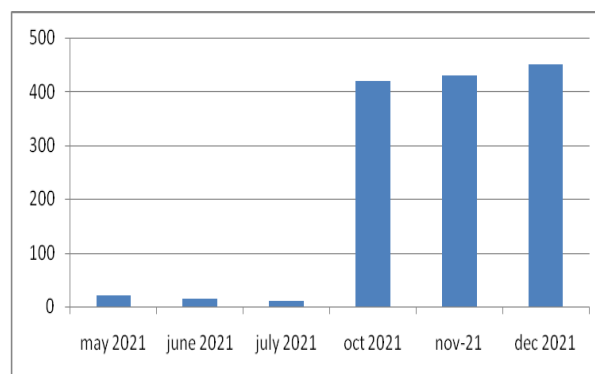
S. no.	Maximum	Month	Minimum	Month
1.	420	October 2021	20	May 2021
2.	430	November 2021	15	June 2021
3.	450	December 2021	10	July 2021



**Fig. 1: *Pteropus giganteus giganteus* roosting of *Pithecolobium dulce* in Jasol, Balotra.**



**Fig. 2: Roosting site of *Pteropus giganteus giganteus* in Jasol, Balotra.**



**Fig. 1: Monthly Population fluctuation of *Pteropus giganteus giganteus* at Jasol, Balotra.**

## CONCLUSIONS

Presently climate change is expected to impact chiropteran species demography and distribution and disrupt biotic interactions. Understanding this is particularly useful in the formulation of conservation policy, adaptation planning, and assessing the extent of susceptibility and reducing the risk of future biodiversity losses. *Pteropus giganteus giganteus* are steadily lowered from the top to bottom of the foraging altitude. *Pteropus giganteus giganteus* always uses short flights and “U” turn to change from one branch to another in the same tree and uses the bipedal and quadrupedal movements on the branches while foraging. *Pteropodids* are playing a beneficial role in two different functions i.e. pollination and seed dispersion. Local climatic condition, cyclic food accessibility, and social interactions among chiroptera are the main factors responsible for evolving solitary or gregarious foliage-roosting behavior in chiroptera. Action plans are required to put off the disturbance to the roosting sites, and trading of chiroptera for food and medicinal use. Defending roosting habitats, where chiroptera rest and reproduce. In summer *Pteropus giganteus giganteus* number decrease because biotic and abiotic factors such as Temperature, humidity, loss of Water and agriculture availabilities, construction work and noise pollution were influenced. All these factors fluctuated the population of *Pteropus giganteus giganteus* roosting site Jasol, Balotra.

## REFERENCES

1. S. Molur, C. Srinivasulu, P. Bates, C. Francis, *Pteropus giganteus*. The IUCN Red List of Threatened Species, 2008.
2. P. Soni, *Roosting behavior and social organization of bats (Chiroptera) barmer district, india*. *International Journal of Research and Analytical Reviews*, 2019; 6 (2): 1170-1176.
3. P. Soni, *Environmental factors influences of chiropterans diversity in kiradu, barmer, india*. *International Journal of Innovative Research In Technology*, 2021; 8(6): 161-163.
4. P.J. Bates, D. L. Harrison, *Bats of the indian subcontinent*. Harrison Zoological Museum, Sevenoaks, England. 1997; 1-258.
5. J. Prajapati, M.K. Chalise, D.K. Karmacharya, *Habitat and Behavioral Observation of Indian Flying Fox Pteropus giganteus (BRÜNNICH, 1782) in Sallaghari, Bhaktapur, Nepal*. *Journal of Natural History Museum*, 2019; 31: 79-94.
6. Cites, *convention on international trade in endangered species of wild fauna and flora*. Appendices, 2017; i, ii and iii.
7. C. R. Tidemann, J. Nelson, *Long-Distance Movements of The Grey-Headed Flying Fox (Pteropus Poliocephalus)*. *Journal of Zoology*, 2004; 263: 141-146.

8. J.H. Epstein, K. J. Olival, J. Pulliam, C. Smith, J. Westrum, T. Hughes , A. P. Dobson, A. Zubaid, S.A. Rahman, M. M. Basir, H. E. Field, *Pteropus vampyrus, a hunted migratory species with a multinational home-range and a need for regional management*. Journal of Applied Ecology, 2009; 46: 991–1002.
9. D. F. Nyhagen, S. D. Turnbull, J. M.Olesen, C. G. Jones, *An investigation into the role of the mauritian flying fox, Pteropus Niger, in forest regeneration*. Biological Conservation, 2005; 122: 491–497.
10. M. J. Vardon, P. S. Brocklehurst, J. C. Z. Woinarski, R. B. Cunningham, C. F. Donnelly, C. R Tidemann, *Seasonal Habitat Uses By Flying-Foxes, Pteropus Alecto And P. Scapulatus(Megachiroptera), In Monsoonal Australia*. Journal of Zoological Society of London, 2001; 253: 523–535.
11. R. Rajchal, *Bats of Nepal*. Institute of Forestry, Pokhara, Nepal, 2007.
12. J.L. Reginald, P. M. Prasath, C. Mahendran, A. Venkatasan, K. Prabhu, B. Ravichandran, S. Molus, *A Survey On The Roosting Sites of Indian Flying Fox Pteropus giganteus Brunnich, 1782 In And Around Coimbatore And Palakkad Districts, India*. Bat Net Ccinsa Newsletter, 2008; 9: 11-12.
13. A. K. Chakravarthy, H .M. Yeshwanth, *status of roost of Indian flying fox (pteropus giganteus brunnich) in karnataka, south india*. Bat net ccinsa newsletter, 2008; 9: 16-18.
14. D. W. Thomas, M. B. Fenton, R. M. R. Barclay, *Social behaviour of the little brown bat, Myotis lucifugus*. Behav. Ecol. Socio biology, 1979; 6: 129-136.
15. A. Purohit, P. Soni, A. Kaur, H. Ram , *Eco-status of chiropteran fauna in and around thar Desert Barmer, India*. International Journal of Conservation Science, 2013; 4: 119-123.
16. P. Soni, *Habitat preference of megabats and microbats in and around thar desert barmer*. International Journal of Creative Research Thoughts, 2021; 9 (11): 340-344.
17. P.Soni, *a review of chiropterological studies and a distributional list of the bat fauna in balotra, india*. Journal of Xidian University, 2023; 17(4): 664-668.