

Report of Indian Flying Fox, *Pteropus giganteus* (Brunnich) (Chiroptera, Pteropodidae) in Dumraon, Bihar

Suday Prasad

Department of Entomology

Current Address: Bhola Paswan Shastri Agricultural College, Purnea- 857302 (Bihar) India

Email: sudayprasad@yahoo.co.in,

ABSTRACT

Bats are the only flying mammals that are capable of true flight. Bats are economically important to our society. They also play vital roles in balancing the ecosystem, seed dispersal, pollination of many edible & medicinal plants; regeneration of forest ecosystem and considered as a universally important bio-indicators. A large size mega bat (female) died of electric shock, was collected near palm tree (*Borassus flabelifer*) south of Veer Kunwar Singh College of Agriculture, Dumraon in the month of January, 2017. The present investigation was conducted for morphometric identification of mega chiropteran *Pteropus giganteus* in Dumraon, Buxar (Bihar). The forearm length and wingspan of this bat was recorded 173.9 mm and 975.8 mm respectively whereas total body mass of 780 mm and head with body length were recorded 258 mm respectively. The species observed as the long snout, hairy, well developed nostril and long pointed black ears. It has also been observed strong clawed toes, second finger with claws and inconspicuous tail. Viewing the presence of orchard and availability of Indian flying fox, *Pteropus giganteus* and other micro chiropteran in these areas it will become quit imperative for further biological and ecological study as well as management of this species.

Keywords: *Pteropus giganteus*, Mammalia, Chiroptera Pteropodidae habitat, Dumraon

Received 30.04.2019

Revised 16.05.2019

Accepted 09.06.2019

CITATION OF THIS ARTICLE

Suday Prasad. Report of Indian Flying Fox, *Pteropus giganteus* (Brunnich) (Chiroptera, Pteropodidae) in Dumraon, Bihar. Int. Arch. App. Sci. Technol; Vol 11 [1] March 2020 : 42-45

INTRODUCTION

India has a rich diversity of bat fauna comprising of approximately to 119 species, 33 genera and 3 families, out of which 14 species are fruit-eating or mega chiropteran (Pteropodidae) belonging to 8 genera and the remaining ones are insect eating of micro chiropteran bats Bates and Harrison [2]; Kumar and Kanaujia [6]. *Pteropus giganteus* is a largest fruit bat and largest flying mammal as well in India [7]. South Bihar has major productive contribution in food grains, fruits, vegetables, spices and flowers which can be increased manifold with improved techniques of system management. During the morning walk it has been collected large size female bat species (*Pteropus giganteus*) died due to electric shock. This has not yet been recorded in this area from south Bihar. Bats are the only flying mammals that are capable of true flight. Bats are important tool used as biological control agents of insect pests and major predator of nocturnal flying insect. Due to loss of its habitat, deforestation and human interference in the tropical region of the world it has reshaped the pattern of distribution of the mammals of the country Bastawde and Mahabal [1]; IUCN [5]. Bats play an important role utilized as ecological services, they used to a travel long distance searching of food and considered as universally important bio-indicators Fujita and Tuttle [3]; [4]. In Bombay *P. giganteus* travelled several kilometers across the sea to Alibag and other destinations along the sea coast for the search of food, Bastawde and Mahabal [1]. Indian flying foxes are primarily feeding on fruits and flowers which are chewed and bitten off. Sinha [13] Although Indian flying foxes act as pests for

destruction of some fruit crops, it also plays an important role in pollination, disperse the seed and pollinating a large variety of plants [9]. More than 400 plant products useful to mankind are derived from 163 plant species depending upon the fruit bats for pollination and seed dispersal Fujita and Tuttle [14]. Therefore, in the present investigation an attempt has been made on observational morphometric notes and report on mega bat *Pteropus giganteus*.

MATERIAL AND METHODS

A Morphometric identification of mega chiropteran *Pteropus giganteus* were studied in Dumraon. Which is a sub-division of district Buxar, about 19 km located (25° 33N Latitude and 84° 12 E Longitude) and 100 km far-away from Buxar and Patna. During the visit of building side of the campus VKS college of Agriculture, Dumraon early in the morning in the month of January 2017, a large size mega bat was seen that was died due to electrical shock near palm tree (*Borassus flabelifera*) of the new building side. The bat was caught with the help of hand net and brought to the department of Entomology and Zoology, VKSCoA, Dumraon, for morphometric measurement and then preserved in formalin and kept in museum for future record. The bat was measured, weighed & identified with the help of available pictorial literature. The taxonomical identification were observed using binocular and photographic methods as per suggested by Tuttle, [14]; Sinha [13]. All measurements regarding size were recorded in mm near accuracy except weight which was measured in gm. Figure in parentheses represented the mean average measurements.

RESULTS AND DISCUSSION

Pteropus giganteus is the largest fruit bat and largest flying mammal in India [6]. The occurrence of the *Pteropus giganteus* in Dumraon, Buxar was studied for the first time during the present research. The morphological measurements were collected and given in Table -1. Sinha [12, 13] reported about the habitat of different species of bats on teak (*Tectona grandis*) custard apple (*Anona squata*), palm (*Borassus flabelifera*), date (*Phoenix silvestris*), mahua (*Bassia latifolia*) and wood apple (*Feronia spp.*) tree in fruiting season. In non fruiting season bats were observed to chew soft leaf and twigs of semal and tamarind trees in Dumka and Sitamarhi. *Pteropus giganteus* were found hanging upside-down over the tree, eg. Eucalyptus globules and *F. benjamina* tree in gregarious colonies (Preveen and Rahaman 2014). They were observed in a diurnal roost and occasionally found flying during the day while actively engaged throughout the night in search of food. In present study mega bat found near palm tree (*Borassus flabelifera*) in Dumraon, species having large eyes and nose; ears was almost observed as long as head which was combined with body. Their wings consisted of an elastic membrane of skin stretched between the elongated fingers of its front limb and back to its hind limb Fig.-1&2. The total body weight of this species was recorded as 780 gm, second finger with claws was also noted with invisible tail. The specimen was observed as lightweight bodies with strong clawed toes with which they cling to a suitable support. Their body was entirely covered with hairs; snout was long and well developed nostril. Ear was long pointed black ear narrowing at the upper tips and wings were comparatively found heavy and large. Their feet were provided with claws twisted at the ends with greater thumb with claws.



Fig-2: Morphometric measurement of *Pteropus giganteus* collected from Dumraon



Fig-2: Ventral view of female bat *Pteropus giganteus* collected from Dumraon, Buxar

A key for the identification, diagnosis, distribution and systematic notes for many species of bats of Bihar has been reported by Sinha [13]. Perveen and Rahaman [11] reported that the pelage (fur) of this species was long, varied in colour of the shoulder and ventral surface, independent of age, sex and climate variations. Sinha [13] reported its distribution and availabilities of *P. giganteus* in North Bihar and Jharkhand. In the present study of *P. giganteus* total body mass (BM) of 780 gm, and head and body length (HBL) was of 258 mm and the ear length (EL) of 38.8 mm was found. Moreover, the differences between 2nd and 3rd metacarpal length, 4th and 5th metacarpal length and 4th and 5th metacarpal length was found 38.8 mm, 38.1 mm and 34.7 mm respectively along with further wingspan (WS) of 985.8 Table-1. Sinha [13] documented and arranged according to their mean weights, *P. giganteus* (775), they also recorded weights of many specimens of both sexes of bats species of Bihar and observations were taken throughout the year excluding pregnant females before feeding. These bats can be identified provisionally on the basis of weight.

Table:1. Morphometric detail of female *Pteropus giganteus* Dumraon, Buxar

S, No.	Morphometric parameters	Measurements
1	Body weight (g)	780
2	Head and body length (mm)	258
3	Ear length (mm)	38.8
4	Hind foot (mm)	48.9
5	Forearm length (mm)	173.9
6	2 nd metacarpal (mm)	93.1
7	3 rd metacarpal (mm)	126.2
8	4 th metacarpal (mm)	93.1
9	5 th metacarpal (mm)	127.8
10	Wingspan (mm)	985.8

In the present observation forearm length was recorded 173.9 mm. it is obvious from the measurements that the forearm in the female is slightly longer than in the male as given by Sinha [12]. Bates and Harrison [2] recorded that bats are the true flying mammals, and according to them wingspan and forearm length were measured, which were 884 ± 18.17 and 174.10 ± 1.73 mm, respectively, because both parameters considered as tools for flight and movement of these bats at present quadrates. Kumar *et al.*, [7] reported the average forearm length and wing span of male bat were 150.66 ± 3.08 and 962.50 ± 02.30 mm respectively.

The behavior like wing fanning during summer and wing wrapping during winter has invariably associated with thermoregulation. Mayer *et. al.*, [8] recorded that bats are a tremendous detector of a number of climatic and environmental factors such as global climate change, forest disturbances, habitat loss, fragmentation, overhunting, urbanization and agriculture intensification. The Indian flying fox *P. giganteus* widely distributed throughout India, the current study reveals the occurrence of *P. giganteus* in Dumraon Bihar. Bates and Harrison [2] stated all over the Indian subcontinent different species of chiropteran are distributed including 119 bat species belonging to 8 families and 37 genera

from Afghanistan, Nepal, India, Pakistan, Sri Lanka, Myanmar, Maldives and Tibet. Bihar located between 25 to 27 degree North latitude the climate of Bihar is mostly sub-tropical. Nevertheless region close to Tropic of Cancer experiences tropical climate during summer. IUCN, [5] reported habitat loss, deforestation and human interference in the tropical region of the world has reshaped the pattern of distribution of the mammals of the country. Simmon [11] and Sinha [13], stated that among all the bat species *P. giganteus* is the world largest bat in comparison to the body weight.

Perveen and Rahman [10] reported regarding *P. giganteus* roosts were the temporary sites for these bats and were then migrated to an unknown area dwelling with the insect of the winter. Sinha [13] individuals bat was observed at Kerala 56 km from Puna, which remain relatively cool even in summer, but their number kept on diminishing in summer, increasing in rainy season and remained unchanged in the spring season. A detailed study about their biology, ecology and conservation will be needed at their distribution sites because bats play vital roles in balancing the ecosystem, seed dispersal and regeneration of forests.

ACKNOWLEDGEMENT

The author wish to express his gratitude to Associate Dean-cum-Principal, Veer Kunwar Singh College of Agriculture, Dumraon, for his kind interested and encouragement. Mr. Mahendra Bhusan, Technical Assistant, VKS College of Agriculture, Dumraon was thankfully acknowledged for assistance during investigation.

REFERENCES

1. Bastawde, D. B. Mahabal, A. (1976). Some biological aspects of the Indian flying fox, *Pteropus giganteus*. *Biological Vigyanam*, 2 (2) 209-212.
2. Bates, P. J. J. and Harrison, D. L. (1997). Bats of the Indian Sub Continent. *Harrison. Zoological Museum*. U.K. PP 258.
3. Fujita MS, and Tuttle MD (1991). Flying foxes (Chiroptera: Pteropodidae). Threatened animals of key ecological & economic importance. *Conservation Biology* 4:455-463.
4. Jones, G Jacobs S. S. Kun T. H. Wiling, M. R. Racey, P.A. 2009. Carpe noctem the importance of bats as bio indicators, endangered species. *Research*, 8:93-115.
5. IUCN. (2009). Red list of threatened species version 2009,1, www.juenredest organization 2 (2):123-129.
6. Kumar, J. and Kanaujia A. (2010), Diversity and distribution of Bat fauna (Mammalia, Chiroptera) in Dist. Lakhimpur-Kheri, Uttra Pradesh, India with special notes on fruit Bats, Nat. Sem. On impact of trends in climate change, on bio - diversity and faunistic systems. 15-20 Feb. at G. K. V. Hardwar abst.35.
7. Kumar, M. Priya, Y. S. Mathur, V. and Elangovan V. (2016). Distribution and conservation issues of Indian flying fox, *Pteropus giganteus* in Uttra Pradesh. Uttra Pradesh State Biodiversity Board, International day for Biological Biodiversity 22 May,133-139.
8. Mayer, C F J. Aguiar, L M S. Aguirre L F. Baumgarten, J, Clarke, F M. Cosson J. (2010). Long term monitoring of tropical bats for anthropogenic impact assessment gauging the statistical power to direct population change. *Biol. Conservation* 43:345-368.
9. Mecklenburg, S. P. Hutson, A. M. Raicy, P. A. (1992). Old world fruit bats an action plan for their conservation. IUCN/SSC Chiroptera specialist group. IUCN, Switzerland, 1-16.
10. Perveen, F and Rahman, F. (2014). Occurrence of Indian flying fox *Pteropus giganteus* (Brunnich) Chiroptera:Pteropodidae in district Charsadda Khyber Pakhtunkhwa, Pakistan. *Intern. Jour. of Fauna and Biol. Studies*, 1(5) 61-64.
11. Simmon N. M. (2005). Chiroptera in: The rise of the placental mammals. K. D. rose and J. D. Archibald, Johns Hopkins University press. *Baltimore* :159-174.
12. Sinha YP, (1990). Taxonomic notes on some Indian bats. *Mammalia* 34:81-92
13. Sinha YP, (1986). The Bats of Bihar-Taxonomy and field ecology. *Records of the Zoological Survey of India*. Miscellaneous publication occasional paper No- 77.
14. Tuttle, M. D. (1979). Status cause of decline and management of gray endangered bat. *Journal of Wildlife Management* 43:1-17.