

## ECO-STATUS OF CHIROPTERAN FAUNA IN AND AROUND BARMER, INDIA

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### Abstract

The survey was carried out from 2010 to 2012 to assess the eco-status of chiropterans in and around Barmer (24°85'04" to 26°32'20"N Latitudes and 70°05'35" to 72°52'14"E Longitudes) in the Great Indian Desert (Thar Desert), India. The population dynamics, species richness and distribution of bats were examined at all possible sites revealing that eco-transformation in this area positively affecting the chiropteran bio-diversity and richness in this area. Up to 1982 only three microchiropteran species i.e. *Rhinopoma microphyllum kinneari*, *Pipistrellus tenuis*, *Taphozous perforatus perforatus* were recorded in this area and the present study revealed five new species in this area. The newly species added from microchiropterans are *Rhinopoma hardwickii*, *Taphozous melanopogon*, *Taphozous nudiventris* and from megachiroptera i.e. *Cynopterix sphinx*, *Pteropus giganteus giganteus*. These findings suggest that eco- transformation in and around Barmer area of Thar desert positively affect the demography and species richness of bats in this area.

**Keywords:** Eco status; Chiroptera; Eco-transformation; Thar Desert; Barmer.

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### Introduction

Bats are only volant mammal that belongs to the order of Chiroptera, which in the second largest subclass of mammals. More than 20% all known mammal species of the world are bats. They play a vital role as "Keystone" species in ecosystem. They are divided in two sub orders i.e. Megachiroptera and Microchiroptera.

The Barmer is one of the dynamic centers for biodiversity. During the last three decades, this semi-arid region has undergone complete eco- transformation. During the middle of this century, Prakash [1] had done extensive study of the ecology of the mammals of Indian desert in Barmer. Up to 1982 this area was extensively studied for chiropteran biodiversity by Prakash [1, 2], Advani [3], and Sinha [4] there were reported three species of microchiropteran species *Rhinopoma microphyllum kinneari*, *Pipistrellus tenuis* and *Taphozous perforates*. After 1982 no systematic study on chiropteran was done in this area. Therefore the present work was undertaken to examine the effect of eco –transformation on demography and species richness of chiropteran in and around Barmer. The area has undergone complete eco-transformation due to high rain fall from last one decade.

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## Material and Methods

### Study Area

This study was conducted in and around Barmer city, covering Jasol (25°50'39"N Latitude 72°15'06" E Longitude), Kiradu (25°39'29"N Latitude 71°22'76"E Longitude), Chohtan temple and cave (25°28'71"N Latitude 71°04'04"E Longitude) and Aadarsh school (25°49'15"N Latitude 72°14'50"E Longitude) (Fig. 1).

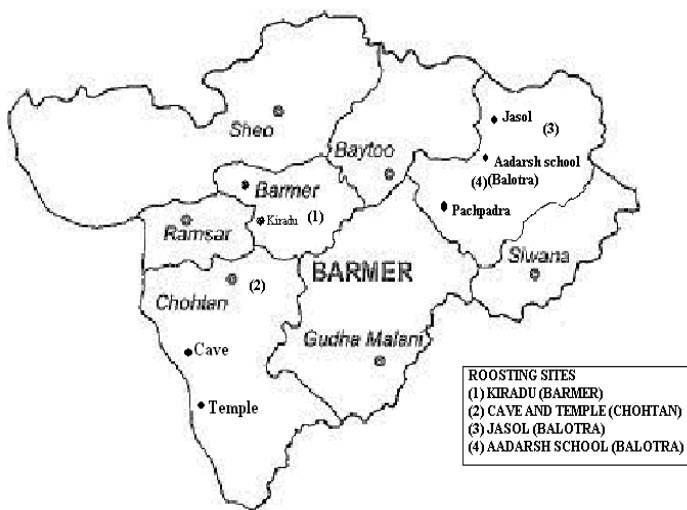


Fig.1. Roosting sites of different species of bats in and around Barmer of Thar desert.

### Methods

The Survey was conducted from September 2010 to March 2012 in and around Barmer. The roosting sites of bats were identifying by bat detector and through the help of people. The counting of bats was done by captures and recaptures method by Fenton and Bell [5], Kunz [6], Kunz and Kurta [7], Barlow [8] and various methods of videography, photographic counts by Thomas and Laval [9]. In the present case, the direct roost count method by Thomas et al [10] was used for the census of the Indian flying fox *Pteropus giganteus giganteus*. The microclimatic changes observed such as temperature and humidity (maximum minimum) were recorded by thermometer. The emerging time by Swift [11] was observed through normal watch and global position system was used for the roosting position. The identification was done through identification key of Bats and Harrison [12].

## Results and Discussion

Thar Desert is a hot spot for biodiversity point. The detail work on chiropteran was done at Jodhpur, Jaipur and Bikaner but Barmer was not explored much. Advani and Sinha had reported only three species of microchiropteran i.e. *Rhinopoma microphyllum kinneri*, *Taphozous perforatus*, *Pipistrillus tenuis*. After the gap of nearly 30 years (1982-2010) in the present study eight species were reported such as *Rhinopoma microphyllum kinneri*, *Rhinopoma hardwickii*, *Pipistrillus tenuis*, *Taphozous perforatus perforatus*, *Taphozous melanopogon*, *Taphozous nudiventris*, *Cynopterix sphinx*, *Pteropus giganteus giganteus* (Fig. 2).

Detailed accounts of each roosting sites are described below.

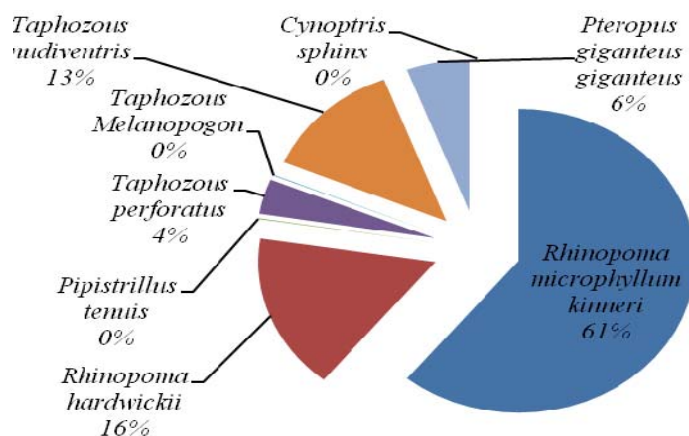


Fig. 2. Diagram showing average composition of chiropteran population in and around Barmer.

### *Megachiroptera roosting sites*

**a. Jasol** (25°50'39" N Latitude and 72°15'06"4" E Longitude) (Fig. 3).

Jasol is twenty kilometer far away from Balotra city. It is a new site of Fruit bat, *Pteropus giganteus giganteus* roosting on the tree Neem (*Azadiracta Indica*) and Vilayati Imly (*Pithecelobium dulce*). The maximum number i.e 450 was recorded in the month of December 2011.



Fig. 3. A colony of *Pteropus giganteus giganteus* roosting on Vilayati Imly in Jasol

### *Microchiroptera roosting sites*

**b. Kiradu** (25°39'29"N Latitude and 71°22'76" E Longitude) (Fig. 4).

Situated in Barmer, is an Ancient temple and surrounded by hills. It is fifty seven kilometer far away from Jaisalmer and thirty five kilometer from west of Barmer. This site revealed six species of microchiropterans (*Rhinopoma hardwickii*, *Rhinopoma microphyllum kinneri*, *Pipistrillus tenuis*, *Taphozous perforatus*, *Taphozous melanopogon*, *Taphozous nudiventris*) and one species of megachiropteran, (*Cynoptris sphinx*) and their population dynamics (maximum) shown in table 1.

**Table 1.** Population dynamics (maximum) of individual bat species at Kiradu roosting site, Barmer

Bat Species name	Number (Maximum)	Month	Year
<i>Rhinopoma microphyllum kinneri</i>	2500	August	2011
<i>Rhinopoma hardwickii</i>	900	August	2011
<i>Taphozous nudiventris</i>	1000	January	2011
<i>Taphozous perforates</i>	50	January	2011
<i>Taphozous melanopogon</i>	54	January	2012
<i>Cynoptrix sphinx</i>	20	September	2011

**Fig.4.** A Colony of *Taphozous perforates* and *Taphozous melanopogon* roosting on the ceiling of Kiradu temple.**c. Chohtan temple and Cave** (25°28'71" N Latitude and 71°04'04"E Longitude)

Chohtan is situated in Barmer. It is forty three kilometer far from Barmer city. There were found two species in the cave i.e. *Rhinopoma microphyllum kinneri* and *Rhinopoma hardwickii*, and one species found in temple i.e. *Rhinopoma microphyllum kinneri*.

*Rhinopoma microphyllum kinneri* maximum number i.e. 30 was recorded in the month of March 2011 and *Rhinopoma hardwickii*, maximum number i.e. 20 recorded in month of March 2012 in the cave. *Rhinopoma microphyllum kinneri* maximum number i.e. 80 was month of January 2012 in temple.

**d. Aadarsh School** (25°49'15" N and 72°14'50" E)

Aadarsh School is situated in Balotra city of Barmer district. There were observed two species of microchiropteran i.e. *Rhinopoma microphyllum kinneri*, *Rhinopoma hardwickii*. *Rhinopoma microphyllum kinneri* maximum number i.e. 50 was recorded in the month of August 2011 and *Rhinopoma hardwickii* maximum number i.e. 30 was recorded in the month of August 2011.

This study revealed that Barmer area is serving as one of the safer habitats for the Microchiropterans of Thar Desert. Prakash [1, 2], Advani [3] Sinha [4] reported three Microchiropteran species (*Rhinopoma microphyllum kinneri*, *Taphozous perforatus*, *Pipistrillus tenuis*) in Barmer upto 1982. After that we have studied the site and found out that there appeared five new species (Three microchiropteran and two mega chiropteran) *Rhinopoma hardwickii*, *Taphozous melanopogon*, *Taphozous nudiventris*, *Cynopterix sphinx*, *Pteropus giganteus giganteus*. The above finding suggested that at Barmer the echo- transformation

positively affected the demography and the richness of the bats species in this area. Similar observation was also made on demography of chiroptera at Jodhpur, Bikaner and Jaisalmer by Purohit and Vyas [13].

## Conclusions

The present investigation aims to assess the eco-status of chiropteran diversity in and around Barmer. The observation reflects that complete eco-transformation in and around Barmer, positively affected the demography of chiropteran in this area. After a gap of nearly 30 years (1982 to 2010), three new species of microchiroptera and two new species of megachiroptera were observed in this area. This eco-transformation also supports the chiropteran conservation in this area.

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