

# Environmental Factors Influences of Chiropterans Diversity in Kiradu, Barmer, India

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**Abstract** - Abiotic and biotic factors positively influenced flora and fauna in Kiradu, Barmer. Chiropterans diversity also influenced in kiradu, Barmer. During study research september 2010 to august 2013 we were found one megachiropteran species (*Cynopterus sphinx*) and five microchiropteran species (*Rhinopoma hardwickii*, *Rhinopoma microphyllum kinneri*, *Taphozous nudiventris*, *Taphozous Perforatus*, *Taphozous melanopogon*) were found in Kiradu, Barmer. Chiroptera number of decrease and increase Because climatic changes, agriculture productivity, human population, construction work, rainfall, ONGC (oil and natural gas company), flood, insect population, and buildings, water are affected.

**Index Terms** - Environment, Chiroptera, factors, diversity, Barmer.

## INTRODUCTION

Barmer (24°85" to 26°32" N Latitude and 70°05" to 72°52" E Longitude) is a sensitive spot on indo-pakistan border. It forms a part of the Thar Desert and is situated in the western part of the State. Barmer is known for its eco-transformation. Chiroptera are divided into two sub orders i.e. Megachiroptera and Microchiroptera. Chiropterans also play an important role as guano (use for good agriculture), pollination, seed dispersion, pest control but face several threats including climate change (Hassi, 2018). Insectivorous bats eat abundant quantity of insects. Insectivorous bats are very beneficial for farmers and ecosystem (Ramteke, 2016).

The entire research study period September 2010 to August 2013, we reported five microchiropteran species (*Rhinopoma hardwickii*, *Rhinopoma microphyllum kinneri*, *Taphozous nudiventris*, *Taphozous Perforatus*, *Taphozous melanopogon*) and one megachiropteran species (*Cynopterus sphinx*) were found in Kiradu, Barmer. In August 2006, Barmer was hit by flash flood.

All this water had changed environment and ecology. Several water channels or natural drains have also shown up. These floods also changed chiropteran diversity. Refinery will increase the economic wealth of Rajasthan, especially Barmer. It is having a unique biodiversity including flora and fauna. Barmer showed significant fluctuations of microclimatic factors during summer and winter. In summer the temperature ranges between (30°C-45°C) and humidity (28%-35%). In winter the temperature ranges between (18°C-24°C) and humidity (44%-56%).

## STUDY AREA AND METHODS

Research time September 2010 to August 2013 we reported microchiroptera and megachiroptera in Kiradu, Barmer (Soni, 2019). Population number of fluctuated every month of time. Many of environmental factors influenced such as Temperature (Maximum and minimum), Relative humidity (Maximum and minimum), Construction work, noise pollution.



Fig.1. Microbats in Kiradu, Barmer. Fig.2. *Taphozous melanopogon* in Kiradu, Barmer

(1) Kiradu (25°39'29"N Latitude 71°22'76"E Longitude):

It is an ancient temple in Barmer. Mega bat *Cynopterus sphinx* reported from Kiradu temple. A mix colony of five microbats viz., *Rhinopoma microphyllum kinneri*, *Rhinopoma hardwickii*, *Taphozous nudiventris*, *Taphozous perforatus*, *Taphozous melanopogon* in Kiradu (Fig.1,2). Some methods were used for bats in roosting site of Kiradu, Barmer such as hand capture (Kunz and Kurta, 1998; Kunz, 1988). The direct roost count method (Thomas *et al.*, 1979).

The visual emergence count method (Easterla and Watkins, 1970; Humphrey and Cope, 1976; Swift, 1980) and capture mark-recapture method (Kunz, 1988) photographic count (Thomas and Laval 1998). The identification was done through identification key of Bats and Harrison (1997). The Digital Minimum-Maximum Hygrothermometer were used to record microclimatic parameters viz., temperature, relative humidity and Global positional system (GPS) was used roosting sites of Barmer (Purohit *et al.*, 2013; soni, 2019).

## RESULTS AND DISCUSSION

### Kiradu

A Maximum number of microchiropteran species *Rhinopoma microphyllum kinneri* (1000), *Rhinopoma hardwickii* (450), *Taphozous nudiventris* (800), *Taphozous perforates* (180), *Taphozous melanopogon* (0), *Cynopterus sphinx* (2) in the month of May-June 2012 because high rainfall, high temperature and low humidity. A Minimum number of these microchiropteran species in the month of December 2011 roosting site of Kiradu (Soni, 2013). Because construction works, human activities, decrease insect population and low agriculture productivity.

For the period of this research September 2010 to August 2013, *Taphozous melanopogon* (Temminck, 1841) has been reported from Udaipur; which south part of Rajasthan (Sinha, 1981). In and around Thar Desert no record was available. During research we reported Black-bearded Tomb Bat (*Taphozous melanopogon*) in Kiradu, Thar Desert Barmer (Purohit

*et al.*, 2012 and Soni, 2019) (Fig.3). August 2006 flood has altered the ecosystem in Thar Desert Barmer. The research study carried out during, all these results positively influenced chiropteran's diversity and complete eco-transformation of Thar Desert Barmer.

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