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HABITAT PREFERENCE OF MEGABATS AND MICROBATS IN AND AROUND THARDESERT BARMER.

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Abstract

Thar Desert Barmer ($24^{\circ}85'04''$ to $26^{\circ}32'20''$ N Latitudes and $70^{\circ}05'35''$ to $72^{\circ}52'14''$ E Longitudes) has a unique biodiversity. It is also known as hot spot. Megachiroptera and Microchiroptera found in this area. Up to 1982 only three microbats such as *Rhinopoma microphyllum kinneari*, *Pipistrellus tenuis*, *Taphozous perforates* were recorded in this area. The newly species added from microchiroptera are *Rhinopoma hardwickii*, *Taphozous melanopogon*, *Taphozous nudiventris* and from megachiroptera i.e. *Cynopterus sphinx*, *Pteropus giganteus giganteus*. All bats species habitats are different.

Keywords: Microbats, Megabats, Habitat, Thar desert Barmer.

Introduction

Barmer is situated in the western part of the state of Rajasthan. Barmer district is very close to the Thar Desert, it has a dry and hot climate throughout the year. The winters are cold and the summers are hot in Thar Desert Barmer. Climate and land use also effects on biological diversity of Barmer (Soni, 2013).

Thar Desert is very significant area of Indian subcontinent. It has a unique biodiversity. It is also known as hot spot. The Flora and Fauna of this region is different from other region. The vegetation of this area is dominated by varieties of trees such as Khejra (*Prosopis spicigera*), Rohira (*Tecoma undulata*), Kair (*Capparis aphylla*), Phog (*Calligonum polygonoides*), Akra (*Calotropis procera*), Jal (*Salvadora persica* and *oleoides*), Ber (*Zizyphus jujuba*), Bordi (*Zizyphus rotundi*), Neem (*Azadirachta indica*), Peepal (*Ficus religiosa*) etc. Shrubs and Grasses found in the region are Bharut (*Cenchrus catharticus*), Siwan (*Panicum frumentaceum*), Makra (*Eleusinegyptica*), Lamp (*Aristida depressa*), Dhamasa (*Fagonia cretica*). This particular areas is also dominated by different type of animals such as Chinkara, Black buck, Jungle cat (*Felischaus*), Mongoose (*Herpestes*)(Soni,2013).



Fig.1 Mega bats area Jasol,Balotra.

Fig.2 Mega bats in Jasol, Balotra.

Bats are split into two major groups, the Megachiropterans (Megabats) and the Microchiropterans (Microbats). Eight chiropteran species six microchiropteran species i.e. *Rhinopoma microphyllum kinneari*, *Rhinopoma hardwickii*, *Taphozous perforatus*, *Taphozous nudiventris*, *Taphozous melanopogon*, *Pipistrellus tenuis*, and two megachiropteran species i.e. *Pteropus giganteus giganteus*, *Cynopterus sphinx* reported (Soni, 2019). Total three species of bats Viz., *Rhinopoma microphyllum kinneri*, *Taphozous nudiventris*, *Pipistrellus tenuis*, were reported in and around Barmer district. During this investigation, all these species of bats have already been reported earlier (Prakash, 1963; Sinha, 1980 and Advani, 1982). Whereas, other five species of chiropterans two megachiroptera (*Pteropus giganteus giganteus*, *Cynopterus sphinx*) and three microchiroptera (*Rhinopoma hardwickii*, *Taphozous perforatus*, *Taphozous melanopogon*) were found in this study area (Soni, 2019).



Fig.3 Micro bats in Kiradu,Barmer.

Fig.4 Kiradu temple,Barmer.

Bats forage in various types of habitats, from forest habitats up to villages, and the spatial distribution of bats activity is mainly determined by the distribution of their prey. Habitat selection is also influenced by the ability of various bat species to exploit these habitats, depending on their structure or their accessibility (Dejong, 1995; Verboom, 1998). Mega bats feed almost fruit and flowers, while micro bats are feed mainly on insects and other invertebrates. Some of the larger Microchiroptera are carnivorous; feeding on fish, amphibians, birds and small mammals. Three species of microchiroptera are (*Desmodus rotundus*, *Diaemus youngi* and *Diphyllae caudata*) feed on blood. *Desmodus* feeds mainly on the blood of livestock (Cattle, Horses, Goats, Sheep and Pigs), poultry and occasionally humans. *Diaemus* prefers avian blood, while *Diphylla* feed exclusively on birds (Soni, 2013).

Bats are mostly colonial; less commonly, bats are solitary. *Pteropus giganteus giganteus* roosting on the trees of Vilayati imeli (*Pithecellobium dulce*), Ashoka (*Saraca asoca*) and Neem (*Azadirachta indica*). Indian flying fox (*Pteropus giganteus giganteus*) live solitary and occasionally also roosts very close to one another (Soni, 2019) (Fig.2) and micro bats viz., Greater mouse tailed bat, *Rhinopoma microphyllum kinneri*; Lesser mouse tailed bat, *Rhinopoma hardwickii* were

monitor roosting in the natural caves, well, man-made tunnels, old building and various historical monuments like forts and havelies (Soni, 2019) (Fig. 3, 5, 6).



Fig.5. Microbats in Temple and cave in Chohtan Fig.6. Microbats in well Kiradu, Barmer

The Egyptian tomb bat (*Taphozous perforates*) was observed in historical place and man-made tunnels whereas Naked rumped tomb bat (*Taphozous nudiventris*) were found roosted in the unattended semi dark portions of historical monuments. Black beard tomb bat, *Taphozous melanopogon* is highly gregarious species living in diurnal roosts which are usually located in temples and caves. The Indian pigmy bat (*Pipistrellus tenuis*) was found roosting in the deep dark caves and different other buildings (Purohit *et al* 2013; Soni, 2019).

(A) Barmer (24°85" to 26° 32"N & 70°05" to 72°52"E)

(1) Megachiropteran roosts:

(a) New sites explored:

(1) Jasol: Megachiropteran (*Pteropus giganteus giganteus*) roosting sites are situated in Jasol (Balotra) Fig. (1, 2)

(2) Kiradu (25°39'29"N & 71°22'76"E): Megachiropteran (*Cynopterus sphinx*).

(2) Microchiropteran roosts:

(a) New sites explored:

(2) Kiradu (25°39'29"N & 71°22'76"E): Microchiropterans (Greater mouse tailed bat, *Rhinopoma microphyllum kinneari*; Lesser mouse tailed bat, *Rhinopoma hardwickii*; Egyptian Tomb bat, *Taphozous perforatus*; Naked rumped tomb bat, *Taphozous nudiventris*; Black bearded tomb bat, *Taphozous melanopogon*; Indian pygmy bat, *Pipistrellus tenuis*) Fig. (3, 4, 6)

(3) Chohton (25°28'71"N & 71°04'04"E) Cave and Temple: Microchiropterans (Greater mouse tailed bat, *Rhinopoma microphyllum kinneari*; Lesser mouse tailed bat, *Rhinopoma hardwickii*). Fig. (5).

(4) Aadarsh school (25°49'15"N & 72°14'50"E): Microchiropterans (Greater mouse tailed bat, *Rhinopoma microphyllum kinneari*; Lesser mouse tailed bat, *Rhinopoma hardwickii*).

The Digital Minimum- Maximum Hygro thermometer were used to record microclimatic parameters viz., temperature, relative humidity and The Global positional system (GPS) was used roosting sites Barmer district (Purohit *et al.*, 2013).

The direct roost count method (Thomas *et al.*, 1979) were used for the census of the Indian flying fox *Pteropus giganteus giganteus* 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) methods were also

used roosting sites. Some methods were used for bats hand capture (Kunz and Kurta, 1998; Kunz, 1988). The identification was done through identification key of Bats and Harrison (1997).

Discussion

Bats are used artificial structure viz., buildings, houses and churches, crevices in walls, chimneys, old monuments and other (Fig.4). Some bats are use only one type of roost such as caves while others may vary the roost type seasonally and in temperate regions bats are used multiple types of roosts. Chiroptera are excellent bio indicators because they respond to a wide range of human induced changes in habitat quality and climate, agricultural growth, urbanization, fragmentation, overhunting, global climate change and habitat loss (Clarke *et al.*, 2005).

There is a variety of habitats under different anthropogenic impact and this fact permits the presence of a rich bat community even during the non-hibernating period (Zukal and Rehak, 2006). Deterioration and loss of habitats through deforestation, intensification of agriculture, urbanization, development of transport infrastructure and wind farms threaten bat populations worldwide (Boyles, 2011; Voigt and Kingston, 2016). A preference for foraging in a single habitat type is very rare in insectivorous bats, as in general they use more habitat types, depending on actual food supply (Brigham *et al.*, 1992) and they move between them during the night. Insectivorous bats use echolocation to obtain information about their surroundings including location and identify of potential prey items (Kalko and Schnitzler, 1989; Obrist, 1995).

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