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Research Article

DISTRIBUTION AND ROOST SITE SELECTION OF RHINOPOMA HARDWICKII GRAY, 1831 OF *RHINOPOMA HARDWICKII* IN JHUNJHUNU, RAJASTHAN, INDIA

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ABSTRACT
Present study on habitat uniqueness of *Rhinopoma hardwickii* was conducted in Jhunjhunu district Rajasthan for a period of one year extending from May 2019 to July 2020. A bat roost of R. hardwickii was observed in urban areas 27° 38' and 28° 31' North scopes and 75° 02' and 76° 06' East longitudes, having more than 270 bats roosting sites in 6 block levels. This paper will help in document new information concerning habitats and amount of *R. hardwickii* in Jhunjhunu and will add new distribution map to the bats of central Rajasthan.

Keywords*: Rhinopoma hardwickii, Roost Site, Thar Desert*

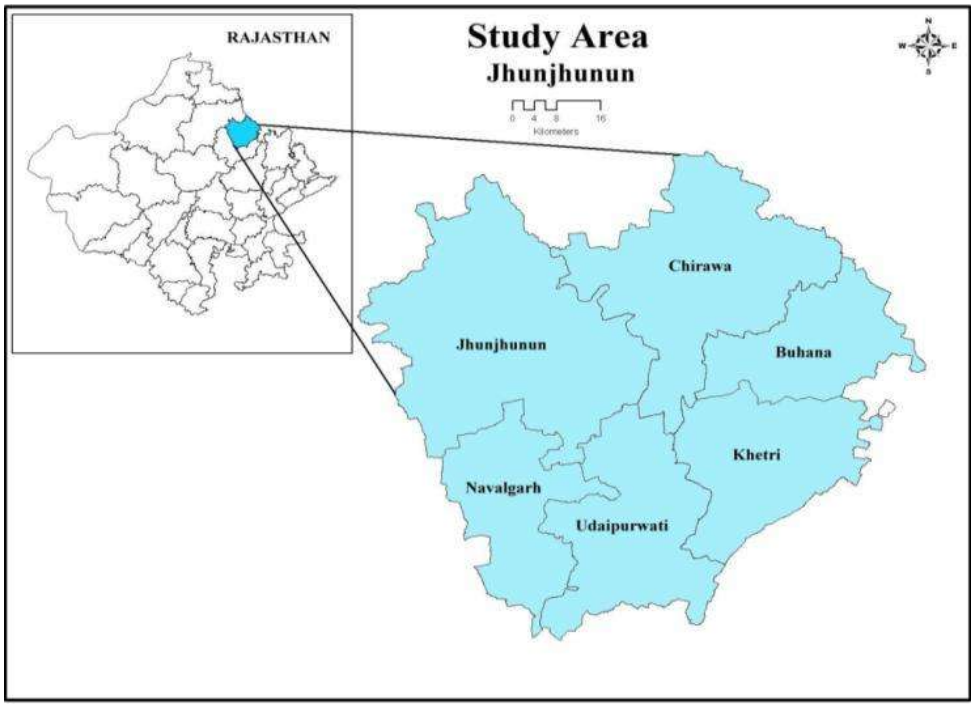
INTRODUCTION

The Thar Desert in Rajasthan occupies only 6% of the total land area of the country. Within this small area, with hostile climates, about 15.8% (68 of 428) species of mammals are still alive. Agarwal (1998) reported 13 orders, 42 families, 180 Genera and 390 species of mammals in India Rajasthan. Thar, as a natural environment, is undergoing a process of evolution. The Shekhawati region is relatively rich in carnivores and a variety of mammals compared to other Thar Desert regions. The main reasons for the poor diversity of these species are human population growth, rapid environmental deprivation, industrial development, illegal mining, irrigation, deforestation and poaching. Unrestrained mines in the Aravalli Mountains and other small clocks in the Jhunjhunu district also affect biodiversity. Altering the composition of flowers will definitely affect the composition of the region's animals. Many mesic species of small mammals increase their distribution near Thar (Parkash, 1995; Bohra, 2011). Bats are the second most species rich request of mammals, with extraordinary natural variety, particularly in the jungles. They embrace a scope of biological system administrations, including seed dispersal, fertilization and bug control. An assortment of biologically and economically significant plants depends on bats somewhat as pollinators or seed dispersers (Kunz *et al.,* 2011). Bats are additionally progressively utilized as bio indicators to evaluate the biodiversity capability of regions and screen ecological changes, and there is along these lines a requirement for dependable techniques for concentrating on bat collections.

In this study we assess the bats species in Jhunjhunu district and study the habits and habitat, roosting and foraging behavior of different bats species and including this we also formulation base line data of *Rhinopoma hardwickii* in Jhunjhunu Rajasthan. Beside this study we will also study the habits and habitat, roosting and foraging behavior of different bats species and formulation base line data of chiropterans in center part of Rajasthan.

MATERIALS AND METHODS

Field surveys were carried out to explore bat fauna from various habitats in district Jhunjhunu. Based on living space structure and geological areas each tehsil of Jhunjhunu were chosen for study. These locales were chosen so that all aspects of the review region are covered. Occasional field trips were made all through this period in the long stretch of June (summer), October (rainstorm) and December (winter). Perceptions taken in two meetings in a day specifically morning meeting of two hour term (6-8 AM in Summer and 5-7 AM in Winter) and evening meeting of one hour span (6-7 PM in Summer and 4-5 PM in Winter). Chiropteran species *Rhinopoma hardwickii* Gray, 1831 is an insectivorous Bat species. This bat roosts in caves, mines, and in dark rooms of historical places and homes which have less disturbances of humans. The study areas are these havalies and other roosting sites in Jhunjhunu and its adjoining areas.



RESULTS AND DISCUSSION

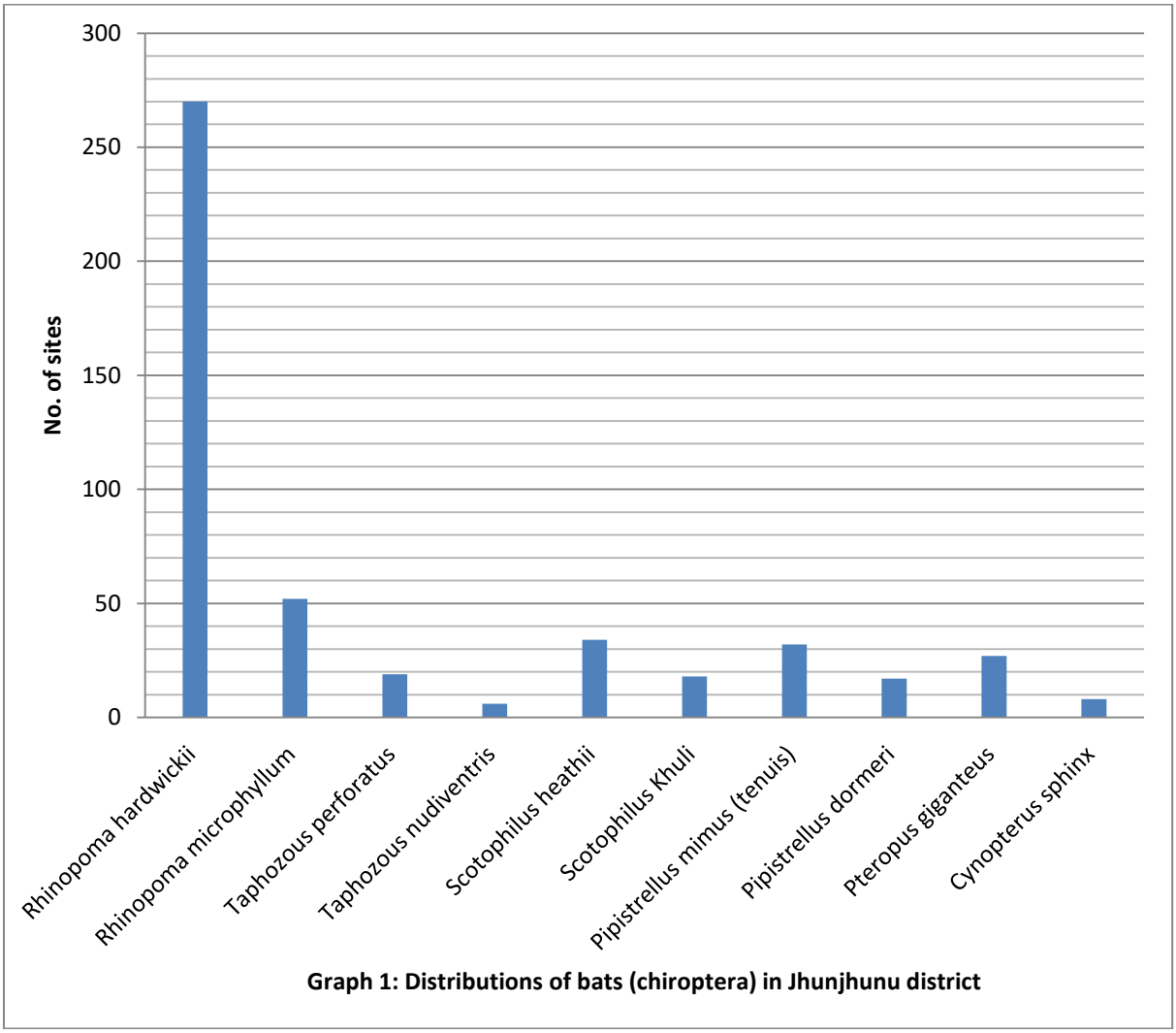
Status assessment plays an important role in understanding the census structure of any species in a particular area. Chiropterans are significant groups of mammals found almost all part of India. Chiropterans (including Mega and Micro chiroptera) are important as they have omnipresent distribution in almost all the states of India. They play important roles in all types of ecosystems. Mega chiropterans largely help in pollination, while micro-chiropterans help in pest control through insect ivory. *Rhinopoma hardwickii* (Gray, 1831) is found in most of Asia and in desert area where this species is most common Microchiroptera. *Rhinopoma hardwickii* has wide distribution in genus Rhinopoma. Face of *Rhinopoma hardwickii* is glandular and ears are connected at forehead. Eye and tragus are well developed. The muzzle bears small trigonal noseleaf terminally. Rhinopoma hardwickii roosts in caves, old homes and barren buildings. Colonies of 35 to 5000 individuals had been recorded in the study area. A total of 10 species and 134 roosting sites were found over approximately 5,928 square kilometer of area (Table 1). Chiropteran species *Rhinopoma hardwickii* Gray, 1831 is an insectivorous bat species. This bat roosts in caves, mines, and in dark rooms of historical places and homes which have less disturbances of humans.

The study areas are these havalies and other roosting sites in Jhunjhunu and its adjoining areas. The colony size of *Pteropus giganteus* was found to consist of 24 to 1179 individuals, for Cynopterus sphinx it was recorded as 3 groups having 2 to 14 individuals. In microbats *Rhinopoma microphyllum, Rhinopoma hardwickii, Taphozous perforatus, Taphozous nudiventris, Scotophilus heathii, Scotophilus Khuli, Pipistrellus mimus (tenuis), and Pipistrellus dormeri,* was reported. Adwani (1982) studied the foraging behavior of mouse-tailed bat Rhinopoma hardwickii and found that its diet varies seasonally. The insect orders Hymenoptera, Coleoptera, and Diptera are preferred food for all four seasons. Each bat species likes distinctive sort of perch site. Appropriation and bounty of reasonable perches relies upon distance to searching region, chiropterans physiology and ecological conditions (Barclay and Kurta 2007; Kunz and Lumsden, 2003). The animals play a major role in pest control - consuming large quantities of crop-eaters every night. With fewer natural options, growers often resort to chemical pesticides. During perch choice various information like precipitation, moistness, light force and temperature and so forth were likewise recorded from Jhunjhunu district. Season of leaving perch and retuning back was likewise recorded on month to month premise. Mayer *et al.,* (2010) renowned that bats are bio indicators and environmental detectors, therefore, susceptible to deforestation, habitat loss and global climate change (Table 2). Their diurnal roosts are comprised of caves, temples and deserted houses (Bates and Harrison, 1997). Bhat and Sreenivasan (1972) distinguished that *R. hardwickii* are colonized in dry and semiarid regions, while they are absent from regions of high rainfall and humidity.

In this study the roost was located in urban areas which comprise of dry and semi-arid conditions. *R. hardwickii* was observed in urban areas, having more than 270 bats roosting sites in 6 block levels (Fig.1 & Graph 1) including Nawalgarh, Udaipurwati, Kheteri, Buhana, Chirawa and Jhunjhunu. Uppermost number of *R. hardwickii* population recover from Nawalgarh and Chirawa due to old hawalies and lowest population encounter from Kheteri and Buhana tehsil with less amount of water and cropping pattern.

Table 1: Macro and Micro bats (chiroptera) distributions sites in Jhunjhunu district

S. No	Species	No. of Location
1	***Rhinopoma hardwickii***	**270**
2	***Rhinopoma microphyllum***	**52**
3	***Taphozous perforatus***	**19**
4	***Taphozous nudiventris***	**6**
5	***Scotophilus heathii***	**34**
6	***Scotophilus Khuli***	**18**
7	***Pipistrellus mimus (tenuis)***	**32**
8	***Pipistrellus dormeri***	**17**
9	**Pteropus giganteus**	**27**
10	**Cynopterus sphinx**	**8**



Graph 1: Distributions of bats (chiroptera) in Jhunjhunu district

Figure: 1. *Rhinopoma hardwickii* colony

Table 2: Perch selection of different bats species

S. No	Local Name	Botanical name	
1	Desi babel (kikar)	Acacia nilotica	*Rhinopoma microphyllum, Rhinopoma hardwickii,*
2	Kumat, khairi	Acacia Senegal	*Rhinopoma hardwickii*
3	Ardoo, Ardu	Adhatoda vasica	*Pteropus giganteus, Cynopterus sphinx*
4	Neem	Azdirachta indica	*Rhinopoma hardwickii*
5	Dhaokada Dhok	Anogeissus pendula	*Rhinopoma hardwickii*
6	Salaran, Salar	Boswellia serrata	*Pteropus giganteus, Cynopterus sphinx*
7	Palas, Tendu	Botanical monosperma	*Pteropus giganteus, Cynopterus sphinx*
8	Hingota, Hintotia	Balanites aegyptica	*Rhinopoma hardwickii*
9	Gundi	Cordia gharaf	*Pteropus giganteus, Cynopterus sphinx*
10	Bargad, Bad	Ficus bengalensis	*Pteropus giganteus, Cynopterus sphinx*
11	Pipal	Ficus religiosity	*Rhinopoma hardwickii*
12	Aam	Mangifera indica	*Pteropus giganteus, Cynopterus sphinx*
13	Khejra,Janti	Propolis cineraria	*Rhinopoma hardwickii*
14	Pilu, Jal	Salvadoran oleoides	*Pteropus giganteus, Cynopterus sphinx*
15	Imli	Tamnarindus indica	*Rhinopoma hardwickii*
16	Farash, Jhau	Tamarix dioica	*Rhinopoma hardwickii*
17	Bordi, Beri	Zizyphus nummularis	*Rhinopoma hardwickii*
18	Rohida	Tecomella undulate	*Rhinopoma hardwickii*
19	Jhinjha	Bauhinia racemosa lamk	*Pteropus giganteus, Cynopterus sphinx*
20	Vilayati babool	Prosopis juliflora	*Rhinopoma hardwickii*
21	Anwla	Emblica officinalis	*Cynopterus sphinx*
22	Siras	Albizia lebbek	*Pteropus giganteus, Cynopterus sphinx*
23	Adusa	Adhatoda vasica	*Pteropus giganteus, Cynopterus sphinx*
24	Shisham	Dalbergia sissoo	*Pteropus giganteus, Cynopterus sphinx*
25	Safeda	Eucalyptus camaldulensis	*Pteropus giganteus*
26	Jamun	Eugenoia jambolana	*Cynopterus sphinx*
27	Sehtoot	Morus alba	*Cynopterus sphinx*
28	Papri	Holoptelea integrifolia	*Rhinopoma hardwickii*
29	Bans	Dendrocalamus strictus	*Rhinopoma hardwickii*
30	Rhonjh	Acacia leucophloea	*Rhinopoma hardwickii*

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