

Review of sex ratio in several bat species inhabiting the Great Indian Desert

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Abstract. Random sampling of bats was done from various roosting sites in and around Jodhpur, the great Indian Desert, to explore the sex ratio of different species of bats. Females were dominated in the population of *Rhinopoma microphyllum*, *R. hardwickii*, *Taphozous nudiventris* and *Rhinolophus lepidus* while in *Pteropus giganteus*, *Taphozous perforatus* and *Scotophilus heathii* males were dominated. Male and females shared equal percentage in population of *Pipistrellus tenuis* of this study area.

Sex ratio, Chiroptera, India, Jodhpur

One of the smallest desert of the world, the Thar Desert, is situated at the crossroads of palaeartic and oriental biogeographical region and lies between 25° to 30° N latitude and 69.5° to 76° E longitudes. Nearly 62% of the Thar Desert is located in twelve districts of Western-Rajasthan and parts of Kutch (Rahmani 1997). A major portion of the Thar desert is occupied either by dry open lands or small patches of grasslands interspersed with trees and thorny bushes (Gupta 1975). Topographically, at certain places, it has low hillocks, with surface covered with sand-dunes and well-rounded quartz grains, hornblende, feldspar and foraminiferous shells (Shankarnarayan 1988).

Out of 114 species of bats reported from India, in the Thar has been found 14 bat species in the recent past, viz. *Pteropus giganteus*, *Cynopterus sphinx*, *Roussettus leschnaulti*, *Rhinopoma microphyllum*, *R. hardwickii*, *Taphozous perforatus*, *T. nudiventris*, *Rhinolophus lepidus*, *Scotophilus heathii*, *Pipistrellus tenuis*, *P. dormeri*, *Megaderma lyra*, *Hipposideros fulvus*, and *Tadarida aegyptiaca* (Prakash 1963, Sinha 1980, Gaur 1981, Bates & Harrison 1997, Chakravarthy & Girish 2003). The entrance of the Thar Desert, Jodhpur (26° 18' N, 73° 02' E) is one of the dynamic centers for biodiversity studies in India. From this region were reported the same species spectrum as for the Thar (Prakash 1963, Sinha 1979, Gaur 1981), however, only eight of them have been confirmed recently: *P. giganteus*, *R. microphyllum*, *R. hardwickii*, *T. perforatus*, *T. nudiventris*, *R. lepidus*, *S. heathii*, and *P. tenuis* (Purohit & Senacha 2002, Senacha 2003).

Extensive work has been done on population dynamics and demography of bats in and around Jodhpur but no systemic work has been done on sex ratio of different bat species there. In the present study efforts have been made to explore sex ratio of different species of bats from various roosting sites in the Jodhpur region.

Random sampling was done at different roosting sites of chiropterans explored in the Jodhpur region. In case of megachiropteran, sex of the roosted individuals was identified by observing them either with naked eyes or with binoculars. Whereas in case of microchiropteran species, bats were caught from different roosting sites either with the help of hand net or with mist nets and then observed to identify their sex. The identification of bats was done on the basis of the key by Bates & Harrison (1997).

The Indian flying fox *Pteropus giganteus* was found to roost in two roosting sites; the Balsamand Garden (26° 20' N, 73° 01' E) and Rail Sadan (26° 16' N, 73° 01' E). At both the roosts, males were found dominated in the population. Out of the 890 individuals of *P. giganteus* observed at both these sites males were found comprising of 75.6% share (Table 1).

Table 1. Status of sex ratio of different species of bats studied in the Jodhpur region

Tab. 1. Pomer pohlaví u různých druhů netopierů skúmaných v regi6ne Jodhpuru

Legend / legenda: N – total number of counted bats for the sex ratio / celkový počet skúmaných netopierov; M – number of males / počet samcov; F – number of females / počet samíc

species / druh	N	M	%	F	%
<i>Pteropus giganteus</i>	890	674	75.7	216	24.3
<i>Rhinopoma microphyllum</i>	248	94	37.9	154	62.1
<i>Rhinopoma hardwickii</i>	73	23	31.5	50	68.5
<i>Taphozous perforatus</i>	25	17	68.0	8	32.0
<i>Taphozous nudiventris</i>	60	23	38.3	37	61.7
<i>Rhinolophus lepidus</i>	32	12	37.5	20	62.5
<i>Scotophilus heathii</i>	56	37	66.1	19	33.9
<i>Pipistrellus tenuis</i>	89	48	53.9	41	46.1

The microchiropteran bat species were caught in various roosts; Mandore Tunnel (26° 21' N, 73° 02' E), Deval of Maharaja Shri Gaj Singh I (26° 21' N, 73° 02' E), Deval of Maharaja Shri Ajit Singh (26° 02' N, 73° 02' E), Palm Tree Plantation (26° 21' N, 73° 02' E) of the Mandore garden; Dark interwoven cave of Daijar Mata Temple (26° 23' N, 73° 03' E); An unattended bungalow of Krishna Nagar Colony (26° 14' N, 73° 02' E); Sagi kee Bhakari of Jhalamand (26° 13' N, 73° 07' E), and Open Convocation Pandal of J. N. V. University (26° 15' N, 73° 01' E).

It was observed that females were dominated in the populations over the males in the Greater mouse-tailed bat, *Rhinopoma microphyllum*, Lesser mouse-tailed bat, *R. hardwickii*; Naked-rumped tomb bat, *Taphozous nudiventris*, and Blyth's horseshoe bat, *Rhinolophus lepidus*. Out of 248 individuals of *R. microphyllum* and 73 individuals of *R. hardwickii* caught from different roosts in Jodhpur females were dominated by its 62.1% and 68.5% share, respectively, whereas of the 60 individuals sampled of *T. nudiventris* 61.7% were females. Likewise, out of 32 individuals of *R. lepidus* sampled, 62.5% were females (Table 1).

However, males were found dominated in the populations of the Egyptian tomb bat, *Taphozous perforatus* and Asiatic Greater yellow house bat, *Scotophilus heathii*. Of the 25 individuals of *T. perforatus* sampled, 68% were males, likewise out of 56 individuals of *S. heathii*, 66.1% were males (Table 1).

Although no any population of Indian pygmy bat, *Pipistrellus tenuis*, could be located at roosts but the samples of this species collected by deploying the mistnets in its foraging area reveals that males and females shares almost equal percentage. Out of 89 individuals of *P. tenuis* caught at various places in Jodhpur males were dominated with 53.9% of its share (Table 1).

Conclusively, in the Jodhpur region, it was observed that males were dominated in roosts of *P. giganteus*, *T. perforatus*, and *S. heathii*, while females dominated in roosts of *R. microphyllum*, *R. hardwickii*, *T. nudiventris*, and *R. lepidus*. Male and females shared equal percentage in population of *Pipistrellus tenuis* sampled by mist-netting.

Súhrn

Prehľad pohlavného pomeru u niekoľkých druhov netopierov obývajúcich Veľkú Indickú púšť.

S cieľom preskúmať pomer pohlaví rôznych druhov netopierov v Jodhpure a v okolí vo Veľkej Indickej púšti sa realizovalo náhodné vzorkovanie netopierov v rôznych úkrytoch. V populáciách *Rhinopoma microphyllum*, *R. hardwickii*, *Taphozous nudiventris* a *Rhinolophus lepidus* dominovali samice, u *Pteropus giganteus*, *Taphozous perforatus* a *Scotophilus heathii* prevládali samce. Vyrovnaný pomer samcov a samíc v sledovnom území sa zistil v populácii *Pipistrellus tenuis*.

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