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# HAIRY-FOOTED GERBIL (*Gerbillus gleadowi*) IN CENTRAL PUNJAB

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## ABSTRACT

Eight specimens of Indian hairy-footed gerbil (*Gerbillus gleadowi*), two males and six females, were trapped from Mochiwala forest plantation 170 JB, tehsil and district Jhang. Sexual dimorphism was evident in this population of gerbil. Males were heavier and larger than the females. Breeding activity was recorded in the months of April and October. Prevalence of pregnancy was 33.33% with a mean embryonic litter size of  $2.50 \pm 0.71$  (SD). Placental scars were observed in 33.33% of the females.

**Key words:** Indian hairy footed gerbil, habitat, breeding, pelage coloration.

## INTRODUCTION

The genus *Gerbillus* extends from Southern Africa northwards to Morocco and Egypt and eastwards to Sinai, Palestine, Syria, North Arabia and Iraq to West Pakistan (Walker *et al.*, 1964). The Indian hairy-footed gerbil (*Gerbillus gleadowi*) belongs to Sahara-Sindh faunistic group (Neronove *et al.*, 1974). It is known to occur very widely in newly irrigated areas of Rajasthan state (India) (Rana *et al.*, 1992). In Pakistan, it occurs throughout Cholistan and Thal desert. It also occurs in uncultivated patches and sand dune regions throughout the Indus alluvial plains. It has been collected from Tharparkar district in Sindh and across the Indus westwards around Dera Ghazi Khan. It has not been found in any rocky and foot hill region and does not extend northwards in Salt Range or westwards in Baluchistan (Roberts, 1997). The present study was designed to describe the habitat, morphology, and general biology of *G. gleadowi* trapped from Jhang district from where it was previously recorded by Taber *et al.* (1967).

## MATERIALS AND METHODS

The present study was carried out from April 2002 to March 2003. Three types of non-cropped habitats viz., i) Forest plantation, 178 JB Mochiwala tehsil and district Jhang, ii) Khairwala main drain sand-dune area, tehsil Gojra, district Toba Tek Singh and, iii) Khurianwala scrubland on Chak Jhumbra road, tehsil and district Faisalabad using rat and mice snap traps. The traps were set on a transect line at stations separated by a distance of 40-50 feet from each station. Three to four traps were set at each station and in each transect line there were 15-20 stations.

Each specimen was weighed to 0.1gm. Pelage characteristics of each specimen were noted and external body measurements i.e. head and body length (HBL), tail vertebra length (TV), hind foot length (HF) and ear length (E) were made before being autopsied to know the reproductive activity.

## RESULTS

Sampling efforts in the non-cropped areas of the central Punjab employing 1349 trap nights resulted in the capture of eight specimens of Indian Hairy-footed gerbil (*G. gleadowi*) that were trapped from forest plantation of 178 JB Mochiwala, tehsil and district Jhang. These specimens were recorded in fall (1.22%) and spring (0.56%) (Table 1) from a habitat that was mainly composed of loose sand vegetated with *Tamarix aphylla*, *Tamarix dioca*, *Delbergia sisso* and some grasses especially *Imperata cylindrica*. In addition, 102 specimens of mice, 17 of Indian gerbil (*Tatera indica*), one of house shrew (*Suncus murinus*) and two specimens of savi's pygmy shrew (*S. etruscus*) were also trapped from these non-cropped areas (Table 1).

**Pelage coloration:** The color of the dorsum showed a changing range from pale reddish buff to grayish brown with sandy grayish buff in the middle while pure white hairs were present on the lower cheeks, throat and ventrum. White spots were quite evident behind the ears and around the eyes. Flanks were present and a line was running from the shanks, along with belly and upper part of the forelimb up to snout.

The tail was grayish brown but lighter in color than the rest of the body. The point from where the tail originated was also covered with white hairs. Ventral side of the tail had white hairs. Tail terminated into a tuft of

grey hairs with brownish shade. Manus along with the lower part of the forelimb had white hairs while the shank and thigh were covered with grey and white hairs.

**Body weight and external body measurements:** Eight specimens of the hairy-footed gerbil were captured from forest plantation. Two of them were male and the rest were female. All the specimens were adults. Table 2 gives the body weight (g) and external body measurements of these specimens. The two sexes of the gerbil exhibited a considerable dimorphism. The males weighed  $31.8\text{gm} \pm 3.18$  (SD), whereas the females averaged  $16.3\text{ gm} \pm 2.31$  (SD). Similarly, the external body measurements of the males were higher than the females. Head and body length in males averaged  $10.1\text{ cm} \pm 0.29$  (SD) and in females  $8.7\text{ cm} \pm 0.38$  (SD), the tail length averaged  $13.3\text{ cm} \pm 0.56$  (SD) and  $10.8\text{ cm} \pm 0.58$  (SD), the hind foot length  $3.0\text{ cm} \pm 0.00$  (SD) and  $2.4\text{ cm} \pm 0.05$  (SD), and ear length  $1.3\text{ cm} \pm 0.07$  (SD) and  $1.2\text{ cm} \pm 0.05$  (SD), respectively. Thus all the external body measurements measured much lesser in females, only the ear length in the two sexes was comparable.

Table 3 gives the proportions of the various external body measurements. According to this Table TV/HBL and E/HBL were almost similar in two sexes whereas the proportion of HF/HBL was somewhat greater in case with the males.

**Breeding activity:** Two males were autopsied. Both had tubules visible in their cauda epididymus. These were captured in the month of April 2002. Six females were

autopsied. All were with perforate vagina. Two pregnant females were captured in October in 2002. Prevalence of pregnancy was 33.33% with mean embryonic litter size  $2.50 \pm 0.71$  (SD), 33.33% females were with placental scars.

## DISCUSSION

*Gerbillus gleadowi* prefers to inhabit regions of sparsely vegetated loose sand dunes conducive for making burrows of simple nature (Rana *et al.*, 1992). Typically they are associated with shifting sand dunes on which bushes of *T. aphylla* and *Calligonum pollygonoides* grow (Roberts, 1997). Forest plantation of 170 JB, Mochiwala, tehsil and district Jhang also provides the same type habitat to this gerbil.

Inter-population comparisons made of *G. gleadowi* made by Rana *et al.* (1975) showed that the male *G. gleadowi* were larger than the females in all the populations. According to Khokhar and Rizvi (1990), the males of *G. gleadowi* had an average body weight of  $29.4\text{ gm} \pm 0.43$  (SE), and HBL of  $99.5\text{ mm} \pm 0.62$  (SE), whereas, the average body weight of females was  $28.8\text{ gm} \pm 0.68$  (SE) and HBL of  $93.5\text{ mm} \pm 1.46$  (SE). Thus the males were significantly heavier and larger than the females ( $t = 6.94$ ; d.f. = 100;  $p < 0.001$ ) and ( $t = 3.48$ ; d.f. = 85;  $p < 0.001$ ), respectively. External body measurements also showed variations with respect to rainfall aridity of the habitat (Rana *et al.*, 1975). *Gerbillus gleadowi* collected at Jhanjhu which received

Table 1. Seasonal variations in the trap success of small mammals in some non-cropped areas of central Punjab in 2002-2003. (n = number of animals captured.)

Season	Habitat type	Trap nights	% Trap success (n)				
			M. spp.	T. i	G. g.	S. m.	S. e.
Summer	Forest plantation	82	-	1.22(1)	-	-	-
	Sand-dune area	57	7.02(4)	7.02(4)	-	-	-
	Scrubland	58	29.24(17)	1.72(1)	-	-	-
	All habitats	197	(10.66)21	3.05(6)	-	-	-
Fall	Forest plantation	150	2.67(4)	3.33(5)	3.33(5)	-	-
	Sand-dune area	33	9.09(3)	6.06(2)	-	-	6.06(2)
	Scrubland	227	16.74(38)	0.44(1)	-	0.44(1)	-
	All habitats	410	10.97(45)	1.95(8)	1.22(5)	0.24(1)	0.49(2)
Winter	Forest plantation	124	0.81(1)	-	-	-	-
	Sand-dune area	86	5.81(5)	4.65(4)	-	-	-
	Scrubland	-	-	-	-	-	-
	All habitats	210	2.86(6)	1.90(4)	-	-	-
Springs	Forest plantation	183	-	1.09(2)	1.64(3)	-	-
	Sand-dune area	98	-	-	-	-	-
	Scrubland	251	11.95(30)	0.80(2)	-	-	-
	All habitats	532	5.64(30)	0.75(4)	0.56(3)	-	-
Combined	Combined	1349	7.56(102)	1.26(17)	0.59(8)	0.07(1)	0.15(2)

(Abbreviations: M. Spp. = *Mus spp.*; T.i. = *Tatera indica*; G.g. = *Gerbillus gleadowi*; S.m. = *Suncus murinus*; S.e. = *Suncus etuscus*)

the greatest precipitation (430 mm) are largest in head and body size and those from Sindh (91 mm) are the smallest. The tail and ear lengths of the gerbil were inversely related to aridity. Various body parts took mid position in gerbils collected from Bikaner (291 mm). Thus, the body size of this species apparently decreases with increasingly aridity. The present study also depicts that sexual dimorphism is present in this species (Table 2).

A litter size ranging from two to five has been recorded by Taber *et al.* (1967). In the Thal desert immature specimens were trapped in March which had probably been born in previous autumn. No pregnant female was found at that time (Taber *et al.*, 1967). Like

*G. nanus* the gestation period is believed to be 20 days and the litters are probably born at two seasons, in the spring and post monsoon or autumn season (Roberts, 1997). In the present study, two females with the litter size of two and three respectively were collected in October i.e. in mid-autumn. However, all the females captured either in October or March were either pregnant or were carrying placental scars in their uteri.

Thus the present study shows that *G. gleadowi* still exists in central Punjab wherever sandy soil and sufficient grass is present. The results confirm that strong sexual dimorphism is present in this species. The males are larger and heavier than the females. The females breed and litter during the spring and fall season.

Table 2. Body weight (gm) and external body measurements (cm) in *G. gleadowi* sample from central Punjab.

Parameters	Males			Females		
	N	X ± S.D	Range	N	X ± S.D.	Range
Body Weight	2	31.8± 3.18	29.5-34.0	6	16.3±2.31	14.1-19.6
Head and body length (HBL)	2	10.1± 0.29	9.9-10.3	6	8.7± 0.38	8.1-9.1
Tail vertebra length (TV)	2	13.3± 0.56	12.9-13.7	6	10.8±0.58	9.9-11.6
Hind foot length (HF)	2	3.0± 0.00	3.0-3.0	6	2.4±0.05	2.3-2.4
Ear length (E)	2	1.3± 0.07	1.2-1.3	6	1.2±0.05	1.1-1.2

Table 3. Some proportions (averages) of the external body measurements of the *G. gleadowi*.

Ratio	Male	Female
TV/HBL	1.31	1.29
HF/HBL	0.29	0.26
E/HBL	0.13	0.13

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