

- SOLDATOVIĆ, B.; SAVIĆ, I.; SETH, P.; REICHSTEIN, H.; TOLKSDORF, M. (1975): Comparative karyological study of the genus *Apodemus*. Acta veterinari, Belgrade 25, 1–10.
- WILSON, A. C.; BUSH, G. L.; CASE, S. M.; KING, M. C. (1975): Social structuring of mammalian populations and rate of chromosomal evolution. Proc. nat. Acad. Sci. USA 72, 5061–5065.
- ŽIVKOVIĆ, S.; SOLDATOVIĆ, B.; MILOŠEVIĆ, M.; MILKEŠ, M.; SAVIĆ, I. (1966): Chromosomal analysis of three populations of *Apodemus sylvaticus* in Banat. Arh. biol. Nauka 18, 37–38.

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## Nesting behaviour of the Indian Gerbil, *Tatera indica indica*

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### Abstract

Observed the nesting behaviour of Indian gerbil, *Tatera indica indica* Hardwicke. 18 adult subjects (6 ♂, 6 ♀, 6 pregnant ♀) chosen from a wild-caught stock, were housed individually and provided with bond paper sheets for nesting. The nests made were sketched, measured and weighed on alternate days.

Apparently, three type of nests are constructed. "Sleeping" nests made by males (mean diameter =  $21.1 \pm \text{S.E. } 0.4$  cm) differ in size and shape from nests made by non-lactating females (mean diam. =  $17.8 \pm \text{S.E. } 0.5$  cm); while "dome" like "Brood" nests elaborated by lactating gerbils are of a different type than "sleeping" nests (mean diam. =  $16.0 \pm \text{S.E. } 0.6$  cm).

Various methods, including shredding of nesting material, are used for constructing the nests. Latencies to rebuilding of nests when scattered, vary widely; minimum latencies are shown by lactating gerbils (< 3 min).

### Introduction

Nest-building in rodents is important both for breeding and thermo-regulation (MORGAN and STELLAR 1950; BARNETT 1975). It has been widely studied in respect to both; though more of laboratory rats and mice than wild rodent species (BARNETT 1975). Nothing is, however, known about the nesting behaviour of Indian gerbil, *Tatera indica indica* Hadwicke. Observations made on nesting activities of captive subjects, are discussed here.

### Material and methods

Observations were made during the warmer periods, in the months of April and May.

Adult gerbils (body weight > 100 g) for the experiments were selected from wild-caught stock. Of the total 18 subjects six were males, six non-lactating females and six lactating females. The gerbils of the former two groups were housed in wire-mesh enclosures,  $1.32 \times 1.00 \times 0.32$  m or  $0.75 \times 0.35 \times 0.35$  m. Pregnant females were kept in all-glass aquaria,  $0.9 \times 0.45 \times 0.35$  m. The side-walls of cages and aquaria were covered with black paper. All gerbils were given a diet of cereals and cabbage; with ad lib. water.

Bond paper sheets,  $29 \times 29$  cm, were provided to each gerbil for nesting. The cages were checked daily. On alternate days, the resident gerbil was trapped and removed from the cage. The nest found

inside was sketched or photographed, measured and weighed on an open pan-balance. The nest material with some fresh paper, was put back in the cage. After this, the gerbil was also returned to it. All operations were completed between 5 to 8 p.m.; or at the start of the activity period.

The time taken in rebuilding the nests was noted each time. Illumination from 100-watt red bulbs was used to aid observations. Methods used in constructing the nests were followed simultaneously.

The nest of lactating gerbils was disturbed daily in the evening hours till the young were weaned. Time taken in rebuilding of nests was noted as before.

The methods described by BAILEY (1959) were followed for statistical analysis of results.

## Results

The results are summarised in Table 1. Type of nests made by gerbils are shown in Figs 1 to 3.

### Construction of nest

Nesting activity of gerbils starts with shredding of nesting material; which is transported to the nesting site. The material is settled by "patting" with fore-feet, and moved by "nosing" and "kicking". The nest walls are raised by "crawling" under it, or the fluffed material.

The nest is always constructed at a point not directly affected by draught. When it is, the nest is shifted to an alternative site. Changes in the position of the cage induce shifting of nesting site thus.

### Type of nests made

Nests made by male gerbils are well spread-out and "saucer" like in shape (Fig. 1). Unlike it, nests made by non-lactating females are smaller and compact, with a prominent central cavity (Fig. 2). Such "sleeping-" nests are converted by pregnant females into "brood" nests after parturition. "Brood" nests are "dome" like in appearance (Fig. 3). They are kept closed from above, until scattered by growing young.

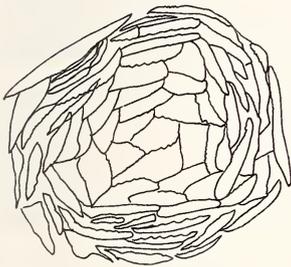


Fig. 1

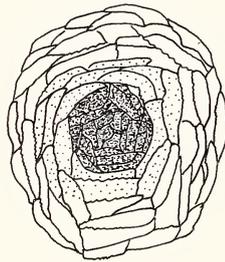


Fig. 2

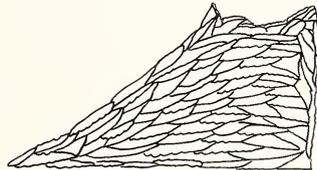


Fig. 3

Fig. 1-3. The figures show the shape of nests constructed by male (Fig. 1), nonlactating female (Fig. 2) and lactating gerbil (Fig. 3). The first two figures have been drawn taking the top view; the third presents the side-view of "dome" shaped "brood" nest

### Dimension of nests

Obviously thus, "sleeping" nests made by male gerbils are greater in diameter but smaller in height than "sleeping" nest of non-lactating females (s. Table). "Brood" nests have the maximum height above ground; and these also weigh the most followed by male and non-lactating female "sleeping" nests (s. Table). Each type thus confirms to specifications; with significant relationship analysed in dimensions - e.g. between nest diameter and nesting material used, nest diameter and nest height (paired "t" tests,  $P < 0.05$  in each case).

Table

Dimensions of nests constructed by male, non-lactating females and lactating gerbils, *T. indica*

Group	Description of Gerbils		Description of nests constructed, means with standard errors of means ( $\pm$ S.E.)		
	No.	Body-weight Range (Means $\pm$ S.E.)	Diameter cm	Height cm	Amount of nesting material used, g
Males	6	136-181 (161.8 $\pm$ 6.7)	21.1 $\pm$ 0.4	4.5 $\pm$ 0.3	80.0 $\pm$ 3.05
Non-lactating Females	6	101-172 (131.5 $\pm$ 12.6)	17.8 $\pm$ 0.5	8.1 $\pm$ 0.3	74.0 $\pm$ 4.1
Lactating Females	6	111-134 (123.1 $\pm$ 4.1)	16.0 $\pm$ 0.6	14.2 $\pm$ 0.3	110.6 $\pm$ 4.4

### Rebuilding of nests

When scattered, the nesting material is paid no immediate attention on return to cage by male and non-lactating females. Latencies to rebuilding of nests vary widely, from 40 min to several hours.

Lactating gerbils, however, rearrange their scattered nests quickly; and persist with this till the young are almost fully weaned. Latencies to rebuilding of nests are noted to be less than 3 min ( $n = 6$ , mean latency = 1.161  $\pm$  S.E. 0.29 min) till about 18 to 22 days post-partum.

### Discussion

Most rodents studied, mice or laboratory rat and wild type *Rattus*, reportedly make two kinds of nests – a small sleeping nest, and in contrast bigger or even substantial “brood” nests (KOLLER 1956; FARRIS and GRIFFITH 1962; WALKEY 1973; MANN and BINDRA 1975). “Sleeping” and “brood” nests are not constructed by Mongolian gerbils, *Meriones unguiculatus*; though seasonal variation is observed in shape and size of their nests (VICTORIA 1973).

Differences on account of sex and reproductive condition in shape and size of nests are, however, quite obvious in case of Indian gerbil, *T. indica* (Figs 1 to 3). Thus, “sleeping” nest of one kind is made by males, and of another distinct type by non-lactating females. “Dome” like “brood” nests are different from “sleeping” nests of the latter. Accordingly, dimensions of nests vary; height and diameter appear to be the functionally important parameters (Table 1).

Similarities between the nesting behaviour of gerbils, *T. indica* and *M. unguiculatus*, are, however, noted in the methods used for nest construction; e.g. shredding and transport of nesting material and setting of it at the nesting site chosen (GLICKMAN et al. 1967; VICTORIA 1973). Except for shredding of nesting material, the same kind of nestbuilding methods, are, however, used for it by many other rodent species, including *Rattus* and *Peromyscus* (FARRIS and GRIFFITH 1962; KING 1963; BARNETT 1975).

Apparently, nest-building fulfills the same functions in gerbils as have been described for other rodent species (BARNETT 1975). “Sleeping” nests are important for thermoregulation and “brood” nests for purpose of maternity. “Brood” nests, unlike “sleeping” nests, are, therefore, rapidly remade when disturbed, to protect the young. However, the behaviour persists in gerbils for much longer, 18 to 22 days after parturition, than in laboratory rats (ROSENBLATT and LEHRMAN 1963).

Thus, the nesting behaviour of gerbils, *T. indica*, is similar to that of rats; but resemblances to nesting behaviour of Mongolian gerbils, are also obvious.

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### Zusammenfassung

#### *Nestbauverhalten der Indischen Nacktsohlen-Rennmaus, Tatera indica indica*

Geschlecht und Paarungsbereitschaft haben Einfluß auf die Nestform und das Nestbauverhalten der Indischen Nacktsohlen-Rennmaus, *Tatera indica indica* Hardwicke. Es können „Schlafnester“ von „Aufzuchtnestern“ unterschieden werden. Ferner unterscheiden sich „Schlafnester“ in Gestalt und Größe, je nachdem, ob von männlichen oder weiblichen Tieren angefertigt. „Aufzuchtnester“ werden ausschließlich von laktierenden Weibchen ausgearbeitet.

Der Nestbau beginnt mit Zerkleinerung von Nistmaterial, welches zum Nistplatz transportiert wird. Dort wird das Material arrangiert durch „Stampfen“ mit den Vorderpfoten, „Stubsen“ mit der Nase und durch Einkriechen in das Nistmaterial und Ausformung des Nestinneren. Zerstörte Nester werden von laktierenden Weibchen sehr schnell wieder hergestellt, jedoch nicht von Männchen und nicht-laktierenden Weibchen.

### References

- BAILEY, N. T. J. (1959): Statistical Methods in Biology. English Univ. Press.  
 BARNETT, S. A. (1975): The Rat: A Study in Behaviour, 2nd. ed. Chicago: Univ. Chicago Press.  
 FARRIS, E. J.; GRIFFITH, J. Q. (1962): The Rat in Laboratory Investigations. New York: Hafner Publ. Co.  
 GLICKMAN, S. E.; FRIED, L.; MORRISON, B. A. (1967): Shredding of Nesting Material in Mongolian Gerbil. Percept. Mot. Skills, **24**, 473–474.  
 KING, J. A. (1963): Maternal Behaviour in Mammals. New York: John Wiley and Sons.  
 KOLLER, G. (1956): Hormonale und psychische Steuerung beim Nestbau weißer Mäuse. Zool. Anz. Suppl. **19**, 123–132.  
 MANN, G. S.; BINDRA, O. S. (1975): Nesting Behaviour of *Mus. musculus bactrianus* Blyth. in the Laboratory. J. Bomb. Nat. Hist. Soc. **72**, 838–840.  
 MORGAN, C. T.; STELLAR, E. (1950): Physiological Psychology. New York: McGraw-Hill Book Comp.  
 ROSENBLATT, J. S.; LEHRMAN, D. A. (1963): Maternal Behaviour of the Laboratory Rat. Maternal Behaviour in Mammals. New York: John Wiley and Sons.  
 VICTORIA, S. B. (1973): Tunneling, Digging and Nest Building. Behaviour of the Mongolian Gerbil. Bull. N. J. Acad. Sci. **18**, 1–9.  
 WALKEY, M. P. (1973): The “Day Nest” of a Rat J. Bomb. Nat. Hist. Soc. **70**, 196–197.

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