

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/266741325>

# Reproduction and abundance of house shrew (*Suncus murinus*) in villages and farm houses of central Punjab

Article in *Pakistan Journal of Zoology* · January 1999

CITATIONS

4

READS

75

4 authors, including:



**Muhammad Mahmood-ul-Hassan**

University of Agriculture Faisalabad

64 PUBLICATIONS 553 CITATIONS

[SEE PROFILE](#)



**Mirza Shehab Afzal Beg**

Liaquat National Hospital & Medical College

78 PUBLICATIONS 440 CITATIONS

[SEE PROFILE](#)



**Akbar ali Khan**

Abdul Wali Khan University Mardan

18 PUBLICATIONS 59 CITATIONS

[SEE PROFILE](#)

shown in Figure 1. Among 295 fishes stomach of 61 fishes were found empty and those of rest were found either "full", " $\frac{1}{4}$  full", " $\frac{1}{2}$  full" or " $\frac{3}{4}$  full". Fishes with "full", " $\frac{3}{4}$  full", " $\frac{1}{2}$  full" or " $\frac{1}{4}$  full" were considered to have fed actively.

From the Figure 1, it is evident that the feeding rate was the highest in early summer (May-June) and no empty stomach was recorded in that period, whereas the lowest rate was observed during winter (November to February).

This might be due to the fact that the later period was the breeding season of the fish. Feeding rate started decreasing from autumn (October) and continued upto winter (February) which might be attributed due to the fact that the fish consumed more food before and after breeding season. This also might be an effect of seasonal changes in temperature which influences food consumption. Khan (*Indian Farm*, 8: 447-453, 1947) and Mustafa *et al.* (*Bangladesh J. Zool.*, 9: 47-52, 1981) also reported a higher rate of feeding activity during summer and a lower rate in winter in case of *Labeo rohita* and in *Colisa fasciata* respectively.

Fisheries Research Laboratory  
Department of Zoology  
University of Rajshahi  
Rajshahi-6205, Bangladesh

A.S. BHUIYAN  
Q. NESSA  
M.D. HOSSAIN

(Received 22 September 1998, revised 1 May 1999)

*Pakistan J. Zool.*, vol. 31(3), pp. 297-299, 1999.

## REPRODUCTION AND ABUNDANCE OF HOUSE SHREW (*SUNCUS MURINUS*) IN VILLAGES AND FARM HOUSES OF CENTRAL PUNJAB (PAKISTAN)

**Abstract.** The house shrew (*Suncus murinus*) infesting villages and farm houses in central Punjab (Pakistan) reproduced mainly during the spring and summer seasons; the prevalence of pregnancy during these seasons was 60% and 71%, respectively, as compared to 4% and zero percent during the autumn and winter seasons. The embryonic litter size ranged from two to five with an average of  $3.89 \pm 0.87$  (SD) ( $n=9$ ). Trap success in autumn was 2.12%, whereas during the other seasons it varied from 0.25% to 0.52%.

**Key words:** House shrew, reproduction, abundance, barn owl, Pakistan.

The house shrew (*Suncus murinus*) is widely distributed in central Punjab where it inhabits cities, towns, villages, farm houses (deras) and croplands. Information on abundance and reproduction of the segment of the shrew population that occurs in the croplands and urban areas of the central Punjab has been provided by Beg *et al.* (*Pakistan J. Zool.*, 18: 201-208, 1986). The present study on the abundance and reproduction of the house shrew living in the villages and farm houses was motivated by the fact that the barn owl (*Tyto alba*) population in the central Punjab heavily depends on this shrew for its food especially during the fall and winter seasons (Beg and Irshad, *Potentials of owl as agents for controlling rats and mice populations in cultivation. II Annual Report*. Department of Zoology and Fisheries, University of Agriculture, Faisalabad, 1998). Presumably, the owls living in the cultivations capture the shrew either from the croplands or in and around the villages and the farm houses. The above sought information on distribution and abundance of the shrew in the villages and farm houses may help in finding an answer to the question why does the owl consume the shrew in much greater proportion than the murid rodents who occur in the croplands, farm houses and villages in larger number?

### Materials and methods

During the course of this study, which lasted from July, 1997 to June, 1998, one of the 12 randomly selected villages and the nearby farm houses (all located within a radius of 70 km of Faisalabad city) was sampled each month using rat and mouse snap traps. Depending on size and structural complexities of houses, the number of traps set per night in a given structure varied from 18 to 24. In all, 90 traps were set for 5 nights during each month; the only exception being the trapping period of February during which only 63 traps were set each night. The proportion of rat and mouse traps set was 2:1.

Each of the captured specimen was weighed (to 0.1 g) and then its body measurements were taken. The reproductive tracts of the female specimens were examined for the presence of embryos and placental scars. In the case of males, smears of testes



and cauda epididymis were examined under a microscope for spermatozoa.

### Results

#### Reproduction

Reproductively active male shrews occurred during all the four seasons of the year. The prevalence of pregnancy in the seasonal samples of adult female shrews varied greatly; being 71% in the summer season, 4% in the autumn season, nil in the winter and 60% in the spring sample. The average for the entire year was 21%. The rate of pregnancy was greater in large-sized females (Table I). The embryonic litter size ranged from two to five with an average of  $3.89 \pm 0.87$  (SD) ( $n=9$ ).

Table I.- Seasonal and body size related variations in prevalence of pregnancy and adult female *Suncus murinus*. Number of specimens in the seasonal samples are given in parentheses.

	Seasons			
	Summer	Autumn	Winter	Spring
Percent pregnant	71.43 (7)	4.00 (25)	0.00 (5)	60.00 (5)
Body weight (%)	22-29	29-36	36-43	43-50
Percent pregnant	0.0 (5)	14.29 (11)	30.00 (20)	33.33 (3)
Body length (cm)	11.0-12.0	12.0-13.0	13.0-14.0	14.0-15.0
Percent pregnant	0.0 (10)	33.33 (18)	25.0 (12)	0.0 (2)

#### Sex ratio and relative abundance

The females out-numbered the males in all except the spring sample in which the females were predominant. However, the latter samples was too small for drawing any sound inference. In none of the seasonal samples nor in the pooled data the ratio of the two sexes was different at a statistically significant level (Table II).

The trap success in all the seasonal samples was low except in autumn when it was larger at a statistically significant level than those of the other seasons ( $F = 10.822$ ;  $df = 3, 8$ ;  $p < .01$  (Table II).

#### Discussion

The data of the present study suggest that the

house shrew population living in the villages and farm houses of central Punjab breeds mainly during the spring and summer seasons. The prevalence of pregnancy was exceedingly low in the autumn whereas in the winter the shrews completely ceased to reproduce. The annual prevalence was 21%. This is in agreement with Beg *et al.* (*Pakistan J. Zool.*, 18: 201-208, 1986) who recorded no pregnancy from October through January in shrew samples collected from the croplands and urban environment where the annual prevalence of pregnancy was 26%.

Table II.- Relative abundance (% trap success) and sex ratio in seasonal samples of *Suncus murinus*.

	Seasons				Total
	Summer	Autumn	Winter	Spring	
No. of animals captured	21	86	17	10	134
Trap nights	4050	4050	3645	4050	15795
% trap success	0.52	2.12**	0.42	0.25	0.83
No. females per male (N)	1:0.64 (18)	1:0.76 (79)	1:0.71 (12)	1:2.50 (7)	1:0.78 (116)

\*\*Significant at .05

The embryonic litter size in shrews from the village and farm houses averaged 3.9 as compared to 3.1 reported by Beg *et al.* (*Pakistan J. Zool.*, 18: 201-208, 1986) for the cropland and urban shrew populations. The average litter size in the South and Southeast Asian populations of shrew ranges from 2.0 to 3.8 (Deoras and Gokhale, *J. Bombay Nat. Hist. Soc.*, 55: 450-460, 1958; Harrison, *Proc. Zool. Soc. London*, 125: 445-460, 1955; Louch *et al.*, *J. Mammal.*, 47: 73-78, 1966; Barbehenn, *Bull. Bishop Mus.*, 225: 247-265, 1962).

The reproductive potential of the house shrew is very low as compared to populations of rats and mice found in the same study area (Beg *et al.*, *Pakistan J. Zool.*, 18: 201-208, 1986). The shrew's trap success in the villages and farm houses was 0.83% which is low as compared to 5.3% for the Faisalabad city and 1.1% for the croplands (Beg *et al.*, *Pakistan J. Zool.*, 18: 201-208, 1986). The trap success of rats and mice in Faisalabad city and in the villages, farmlands and croplands of central Punjab is far greater than that of the shrew (Khan, *Biology*



and ecology of some rodents of agriculture in central Punjab, Ph.D thesis, Department of Zoology and Fisheries, University of Agriculture, Faisalabad, 1982; Mushtaq-ul-Hassan, *Population dynamics, food habits and economic importance of house rat (Rattus rattus) in villages and farm houses of central Punjab Pakistan*, Ph.D thesis, Department of Zoology and Fisheries, University of Agriculture, Faisalabad, 1993). In spite of this fact the shrew dominates in the diet of the barn owl in central Punjab especially during the colder months of the year when its numbers far exceed the combined number of all the 10 species of rodents recorded in the owl's pellets (Beg and Irshad, *Potentials of owl as agents for controlling rats and mice populations in cultivation. II Annual Report*, Department of Zoology and Fisheries, University of Agriculture, Faisalabad, 1998). During these months of recruitment of young shrews to the population greatly declines or stops due to the cessation of the process of reproduction. But, somehow the shrew becomes more vulnerable to the owl's predation during these months due to some behavioural adaptation.

The barn owl prefers the house shrew in winter

over rats and mice as a source of food. However, during the spring and summer seasons the abundance of the shrew in the diet of the owl decline to 52% and 23%, respectively, in favour of rats and mice. Increased utilization of rats and mice during these two seasons seems to be related to their higher abundance and enhanced vulnerability to the owls predations due to less vegetation cover in the croplands (Beg and Irshad, *Potentials of owl as agents for controlling rats and mice populations in cultivation. II Annual Report*, Department of Zoology and Fisheries, University of Agriculture, Faisalabad, 1998).

#### Acknowledgements

Department of  
Zoology and Fisheries,  
University of Agriculture,  
Faisalabad

M. MUSHTAQ-UL-HASSAN  
M. MAHMOOL-UL-HASSAN  
M.A. BEG  
A.A. KHAN

(Received 27 February 1999, revised 15 June 1999)