

**NATIONAL PROGRAMME FOR RODENT PEST  
MANAGEMENT**



ICAR

*Handwritten signature*

**RODENT NEWSLETTER**

Vol. 4, No. 1

February, 1980

**COORDINATING & MONITORING CENTRE  
CENTRAL ARID ZONE RESEARCH INSTITUTE, JODHPUR**

## R. rattus in 'P' Ward of Bombay

P.J. Deoras and Manorama Mittal  
Patkar College, Goregaon, Bombay 62

A study of the rat collection was taken up in the suburban 'P' Ward of Bombay to observe any change in the frequency of the population of *R. rattus* and *B. bengalensis*. The collection showed a predominance of *R. rattus* (72.89%) over *B. bengalensis* (12.27%). This observation was in contrast to the percentage collection of these two species from other wards of Bombay city. *B. bengalensis* is the predominating species in those except in the area of Bombay Port Trust.

In the collection at 'P' Ward, two sub-species of *R. rattus* were observed all the year round; *R. rattus rufescens* and *R. rattus wroughtoni*. Besides these, one more variety of *R. rattus*, with one or more white patches on its fur-coat in pectoral or pelvic regions was noted.

*R. rattus wroughtoni*, was caught in a small number (2.3%) as compared to *R. rattus rufescens*

(97.7%). This first sub species is supposed to be a wild variety, but it appears that it has started visiting the residential areas for food and shelter. It is more susceptible to plague.

*R. rattus*, with the white patch, seems to be a new variety. The morphology of these three sub-species and variety was studied for the sake of comparison along with a detailed karyological study. *R. rattus rufescens*, and *R. rattus wroughtoni* showed similarity in their Karyotype, but *R. rattus* with the white patch showed some difference in the number of graded metacentric and graded telocentric chromosomes.

The introduction of the white patch variety in the rat population is of significance from the public health point of view, since it is still more susceptible to the infection by *Yersenia pestis*.

## Rodent damage in sugarcane

Om Prakash and P.N. Avasthy  
Indian Institute of Sugarcane Research, Lucknow

Field assessment of the magnitude of the rodent damage was attempted at the Institute Farm

during the month of November-December, 1978 on early (Co. J.64) and late maturing varieties as also

from first ratoon for comparison with an early variety (Co. J.64) as both mature almost at the same time. Two fields, one hectare each in size, growing spring planted

cane as well as first year ratoon were selected for the study. Four 50 m long rows were marked at four places in each field and observations were recorded.

Nature of crop	Variety	No. of rat burrows/ha	No. of damaged clumps/ha
Spring planted	Co. 1148	2289	356
—do—	Co. J. 64	2400	600
Ratoon (1 year).	Co. 1158	800	180

#### Average of 4 observations

Maximum number of burrows were noted in Co. J. 64 (an early maturing variety). Though there was not much difference in the number of burrows in Co. 1148 and Co. J. 64, the number of damaged clumps was almost double in the latter variety. This was

due to early maturity of Co. J.64. A comparison between the first ratoon crop and Co. J. 64 on the other hand clearly indicated that rodents preferred a plant cane to ratoon, perhaps on account of the hardness of the rind in the latter.

### Rodent damage survey in twenty five foodgrains godown at Pune

M.S. Pradhan

Zoological Survey of India, Western Regional Station, Pune

Twenty five godowns with the capacity varying from 1500 to 65,000 'Gunni' bags were selected for the present survey. The contents differed from various foodgrains to cattle feed. It was observed that most of the owners were careless about the construc-

tion, condition and maintenance of their godowns. In most of the cases the flooring was deteriorated, showing numerous holes, the roofs were damaged and open to the exterior for the pest's entry. The arrangement of the bags was not systematic. Two godowns, side

by side, one having a cattle feed while the other storing human foodgrains, had maximum pest problems because of bad maintenance. The rats, in hundreds, used to take shelter and drink water in the cattle feed godown while they did considerable damage, which was approximately 25 per cent of the total cost, to the godown storing foodgrains. It was suggested that the owner of the cattle feed should cut off the water line inside the godown while the other should protect his godown preventing the rat's entry by constructing concrete walls. The damage was reduced by a noticeable margin of 15-20 per cent.

The case was different with the others. The loss of foodgrains due to transportation and during the business was also questionable. The owners reported that this kind of damage was unavoidable for them even though it amounted to 10 bags per month. The total damage varied from 5% to 25% of

the total cost. This includes the cost of wastage on the floor during the transactions. The major pests are *Rattus rattus rufescens*, *Bandicota*, and bird spp. Almost all the owners either use, certain pesticides in an unscientific method or give contract to private company for a year for the eradication of rats. The success, as per their claim, is 60% to 75%. One nicely constructed godown of the capacity of 65,000 bags, neatly arranged, where proper care was taken to prevent the entry of rodents and which simultaneously gave a contract to a private company showed an average damage of only 5 per cent of the total cost. Therefore, not proofing of the godowns, the arrangement of bags and proper use of pesticides should be looked after carefully. Use of water inside and near the godowns should be avoided. Even a check should be put on the wastage of grains falling on the ground during transportation and transaction, because man is equally responsible for the damage.

### Opinion survey on positivity of rodent control

D.V. Ramana and M.L. Sood

PAU, Ludhiana

During N. S. S. camp on rodent control (July 20-29, 1978) at Birmi, Phaglia and Humba villages (Ludhiana district) an opinion survey on

the positivity of rodent control was conducted.

Results indicated that people fully realised the serious nature of

losses due to rodents. About 85 per cent people favoured rodent control campaigns. Similar percentage of people were of the opinion that rodents inflict a daily loss of 1-6 kg per household and

their number in a house is about 30. They further opined that rodent control can be done by mechanical means (using sticks, cage trapping) and by chemicals. Nobody believed in worshipping the rats.

### Baits for the control of the Spiny field mouse, *Mus platythrix* Bennett

A.M.K. Mohana Rao and K. Purushotham  
Dept. of Zoology, S.V. University, Tirupati

The Indian spiny field mouse, *Mus platythrix* Bennett is widely distributed in India and is a predominant pest for kharif crops and vegetables. The results of the bait preference studies indicate that the mouse is consistent in preferring food items. Being local crops of this area and on the cost worthiness also cracked rice in alternation

with cracked bajra can be recommended as effective baits for their control. Addition of groundnut oil enhance the palatability and consumption of the test bait. Sugar and salt did not show any additive capacity. There was no significant difference in the consumption of bait materials when offered in single and multiple choice.

### Study of activity, exploration and sampling of *Rattus rattus* in "Plus Maze"

Devendra Bhardwaj and Ishwar Prakash  
Central Arid Zone Research Institute, Jodhpur

Both sexes of adult *Rattus rattus* were individually maintained in a plus maze and observations were made at night under infra-red light on two groups of *Rattus rattus*, one freshly captured (body weight range 115-180g.) and the

other acclimatized for a week in the laboratory (131-180g.). The period of activity was recorded by stop watch for one hour on 6 nights. Two different foods were provided in two arms, water in the third and the fourth arm was kept

empty. Foods and water were rotated every day in the arms in a cyclic fashion.

Freshly captured rats were observed to be very active, perhaps owing to their introduction in a new environment. The total number (61/hr.) of visits to all arms was usually the highest on the first three days when the animal was in completely strange conditions, whereas the activity of the acclimatized rats was low (41 visits/hr) on the first day of introduction in the maze. Mean daily

food consumption of acclimatized rats in residential mazes was more (18g) than the freshly introduced ones (13g). The arm containing preferred food was visited more (14 per hour) than the one in which less preferred food was lodged (6 per hour) by both the groups of rats. The empty arm was visited least (3/hour).

An interesting observation was made that all the rats before visiting the next arm rested for a few minutes in the central chamber.

### Field efficacy of Aluminium phosphide and Rodafarin 'S'

A.P. Jain and B.C. Das  
Central Plant Protection Training Institute, Hyderabad

Burrows of *Bandicota bengalensis* were fumigated in various fields of paddy, tomato and brinjal. The results indicated that effective and economical dosage is 1.5 g/burrow

(Table 1). Though 3 g formulation achieved highest kill, practically there is no difference with the results of 1.5 g/burrow formulation used.

Table 1 Showing number of burrows treated with different dosages of Aluminium phosphide and percent control.

Dosage tested per live burrows (g)	No. of burrows treated	No. of burrows reported	Per cent control
3.0	34	2	94.1
1.5	154	14	90.9
0.75	167	63	62.3



In a heavily infested poultry shed, at All India Coordinated Project on poultry for eggs, at Rajendranagar, measuring 40 x 7 m, pre-control trap index was 3.125 mice/100 traps/24 hours. The major rodent population in the shed was constituted by *Mus musculus tytleri* but *Rattus rattus* was also seen along with *Bandicota indica*. Exposure of the liquid baits of Rodafarin 'S' for 10 days indicated that on third day one *Rattus rattus* and 3 *Mus musculus* succumbed to poisoning. This was followed by juvenile *Bandicota indica* on fourth day. Interestingly all were females. This indicates that females of *Rattus rattus*, *Mus musculus* and *Bandicota indica* are more susceptible to Rodafarin 'S' poisoning than those of the males. The post control

### Rodent Research at D.P.I.L., Denmark

Paraffin blocks containing 0.1% ergocalci-ferol and other blocks of 0.1% cholecalciferol were tested and approved for the control of sewer rats.

New rodenticides like pyrinuron (RH-787) with and without sugar, brodifacoum and difenacoum are being tested against wide variety of rodent pests including commensal ones at different concentrations. Both solid and liquid baits are being used. Existing chemicals like Warfarin, Coumatetralyl, Coumete-

trap index was found to be 0.520 mice/100 traps/24 hours indicating a reduction in the mice population by 86.6 per cent.

In a ten day period a total of 161 *M. m. tytleri*, 8 *Bandicota indica* and 3 *Rattus rattus* were killed.

Interestingly, during 1977 when the control operation was launched the rodent population comprised solely of *Rattus rattus*. Due to removal of *Rattus rattus*, *Mus musculus* colonised the shed as the predominant rodent species followed by *Bandicota indica*. In the vicinity of shed, however, burrows of *Bandicota bengalensis* were observed. also. *Rattus rattus* constituted only 1.7 per cent in the present rodent population.

traly-Na., Norbormide etc. are also being evaluated on *Rattus norvegicus*, *Microtus arvalis*, *M. argestris*, *Rattus rattus* and *Mus musculus*. *Mus musculus* has been found to develop strong resistance towards Warfarin and Coumatetralyl and to a lesser degree towards Difenacoum.

Deterrent effect of odour was observed in above mentioned species in experimental cages using droppings of weasel (*Mustela nivalis*). No tendency of avoidance was reported.

### Significance of body fat in relation to basal metabolic rate in some Indian desert rodents

S.P. Goyal, P.K. Ghosh and Ishwar Prakash  
Central Arid Zone Research Institute, Jodhpur

Four species of Indian desert rodents, viz. *Tatera indica*, *Meriones hurrianae*, *Rattus meltda* and *Golunda ellioti* have been found to have basal metabolic rates (BMR) lower than the values expected from the metabolic rate body weight relationship for mammals.

The low BMR in these rodent species are evidently not due to

any large accumulation of body fats in these animals, but may be somehow related to the process of their niche utilization.

Among the four species examined, only *T. indica* and *M. hurrianae* have any appreciable stores of body fat, presumably for use during summer when both food and water scarcity conditions prevail within the desert.

Table 1. Basal metabolic rate and Fat/FBW ratio in four Indian desert rodent species

Species	Mean body weight (g)	Basal metabolic rate, M (cm <sup>3</sup> O <sub>2</sub> /g h)		Fat/FFBW
		Actual	%expected*	
<i>T. indica</i>	86.8 (7) ± 3.26	0.87 ± 0.067	78.6	0.025 (6) + 0.0030
<i>M. hurrianae</i>	72.3 (5) ± 6.83	0.74 ± 0.052	63.0	0.053 (4) ± 0.020
<i>R. meltda</i>	67.4 (5) ± 5.61	0.87 ± 0.040	73.1	0.047 (2) ± 0.001
<i>G. ellioti</i>	56.2 (1)	1.08	87.0	0.060 (2) ± 0.004

\*Percentage expected = (actual M/expected M) 100, where expected M = 3.4 W<sup>-0.25</sup> (McNab, 1966).

Figures in the parenthesis indicate the number of animals used.

## Announcements

The third International Theriological Congress is scheduled to be held during August, 16-20, 1982, at the University of Helsinki, Helsinki, Finland. Deadline for submitting abstracts of papers is March 31, 1982. Further information if required can be had from the Secretary General, International Theriological Congress, University of Helsinki, SF-00100, Helsinki 10 (Finland).

A Symposium on "Biology of the House Mouse" was held at

London on 22-23 November, 1979

ICAR will organize a workshop on "Rodent Research and Training" at Department of Vertebrate Biology, University of Agricultural Sciences, Bangalore, during August, 1980. Further details can be had from Coordinator and Principal Animal Ecologist, CAZRI, Jodhpur or Prof. C. P. Channa Basavanna, Department of Entomology, UAS, Hebbal, Bangalore.

## Recent Literature

- Agarwal, V. C. and S. Chakraborty 1979. Taxonomic notes on some Oriental Squirrels. *Mammalia* 43 (2) : 161-172.
- Ashton, A. D. and W. B. Jackson 1979. Field testing of rodenticides in a resistant-rat area of Chicago. *Pest Control* 47 (8) : 14-16.
- Barnett, S. A., R. G. Dickson and W. E. Hocking 1979. Genotype and environment in the social interactions of wild and domestic Norway rats. *Aggressive Behav.*, 5 : 105-119.
- Berry, R. J., W. N. Bonner and J. Peters 1979. Natural selection of house mice, *Mus musculus* from South Georgia (South Atlantic Ocean). *J. Zool.* 119 (3) : 385-394.
- Brown, J. C. 1979. Techniques in Mammalogy. Microscopical examination: Histochemical methods. *Mammalian Review*, 9 (3) : 188-234.
- Carr, W. J., J. T. Hirsch, B. E. Campellone and E. Marasco 1979. Some determinants of a natural food aversion in Norway rats. *J. Comp. Physiol. Psychol.* 95 (5) : 899-906.
- Davis, L. S. 1979. Social rank behaviour in a captive colony of polynesian rats (*Rattus exulans*). *New Zealand J. Zool.* 6 (2) : 371-380.
- Dominic, C. J. and S. D. Pandey. 1979. Suppression of oestrus inducing field mouse *Mus booduga* Gray by treatment with antiandrogen. *Endokrinologie.* 74.1.

(Contd. in next number)

The next issue will appear in May, 1980. Contribution for inclusion in the Newsletter may please be forwarded to :

Coordinator

National Programme for Rodent Pest Management  
Central Arid Zone Research Institute,  
Jodhpur-342003

Published by the Coordinator of the National Programme for Rodent Pest Management, ICAR  
CAZRI, Jodhpur and printed at  
Rathi Printers, Pungalpara, Jodhpur-342001