NATIONAL PROGRAMME FOR RODENT PEST MANAGEMENT

ICAR

# RODENT NEWSLETTER

Vol. 5, No. 1 February, 1981

COORDINATING & MONITORING CENTRE
CENTRAL ARID ZONE RESEARCH INSTITUTE, JODHPUR

## Effect of steroid hormones on the reproductive system of male Indian gerbil, *Tatera indica indica*

**T.O. Sasidharan**

Division of Animal Studies, Central Arid Zone Research Institute, Jodhpur

Effect of steroid hormones, Testosterone propionate (TP) (90 $\mu$g/ animal/day), oestradiol benzoate (OB) (0.015 $\mu$g/animal/day) and a combination of these two (90 $\mu$ g-TP+0.015 $\mu$ gOB/animal/day), administered over a period of 10 days, on the genital organs and spermatozoa of adult male Indian gerbils, *Tatera indica indica* have been investigated. Although the individual hormone treatments had no apparent effects on genital organ weights, combined treatment with TP and OB was found to reduce the weights of the testis, epididymis, vas deferens, and prostate gland significantly. While TP+OB treatment reduced sperm concentrations in the distal segment of epididymis and also in the vas deferens, treatment with either TP or OB could reduce it in the vas deferens only. In both the segments the reduction was more pronounced after the combined hormone treatment. The effects on the fructose, lactic acid, and sialic acid levels in different parts of the reproductive system were also more pronounced only after the combined treatment of TP and OB. These findings tend to indicate that treatments with combinations of male and female sex hormones may have fertility control potentiality.

## The Norway Rat, *Rattus norvegicus* reappears in the suburban area in West Bengal

**Ajoy Kumar Mandal**

Zoological Survey of India, 8, Lindsay Street, Calcutta 700016.

The Norway Rat or Brown Rat, *Rattus norvegicus* is not a native of India, but has been introduced through human agencies. It does not appear to have been able to settle down satisfactorily, and is found in seaports; larger towns and cities mostly around grain godowns. In West Bengal, so far this rat is known only from Calcutta and Howrah city areas. Moreover, its population has been reduced much in these cities than before and is replaced by the Lesser Bandicoot Rat, *Bandicota bengalensis bengalensis*.

The author trapped two rats on 23 rd March 1977, from a grocer's shop at Sakherbazar, a suburb of Calcutta in the 24-Parganas District. They have been identified as *Rattus norvegicus*. On the basis of information supplied by the owner of the shop and on careful personal observation, a colony with a large number of individuals of this rat was noticed behind the shop by the side of small ditch full of water. *Rattus rattus arboreus* and *Bandicota bengalensis bengalensis* were also trapped from the same locality.

The above identification and detection of the colony of *Rattus norvegicus* at sakherbazar revealed that although the number of this rat has been reduced considerably in the city areas, yet it has re-appeared in the suburban areas and it successfully lives side by side with *Rattus rattus arboreus* and *Bandicota bengalensis bengalensis* in the same habitat.

## Studies on *Mus* species in Goregaon 'P' ward

**P. J. Deoras and Miss Sudha Bhatt**
Patkar College, Goregaon, Bombay 62

House mouse, *Mus musculus* Linn. were collected from Goregaon East, Goregaon West and Malad regions and were brought daily to the 'P' ward office. The three regions have different ecological textures. Goregaon East has residential as well as some hilly, and agricultural park areas, Goregaon west is almost all residential with few industrial estates, and has a purely urban outlook. Malad on the contrary is all residential with some slums and gives a suburban outlook. The ecological distribution of the three main subspecies of genus *Mus* is as follows :

i) Goregaon (East) is dominated by *M. m. tytleri*

ii) The less dominating subspecies *M. m. urbanus* is found more in Goregaon (west) and Malad.

iii) Malad is dominated by *M. m. castaneous*

Morphological studies in details, have been carried out on these three sub-species, and one of the important aspects is the study of *palatal ridges*. About fifty specimens of each subspecies have been studied to see the variations in the number, placing and shapes of the palatal ridges in hard and soft palate of the buccal cavity.



The palatal ridge show a definite range of variation in different sub species of *Mus musculus*. Even in the same species there is also a variation. However, these variations are correllated with the ecological conditions where these mice are found.

## Repulsive or offensive odours in rodents

**M. Krishnamurthy**
Department of Entomology, Andhra Pradesh Agril. University, Hyderabad-500 030

The House mouse *Mus musculus* is very common species in the house holds of Hyderabad City. I could catch and kill a number of them in my residential house in Hyderabad using Sherman traps and wheat flour bait. It was used in several other houses also successfully in twin cities.

As there are a number of rats in my own native place, Vizianagaram (Andhra Pradesh) on the east coast creating lot of nuisance in the residential house of my parents. I took the same Sherman traps used in Hyderabad along with me to my native place with the idea of getting some relief from them. To my surprise, this trap failed to attract and trap even a single rat there even though I used the same bait material of wheat flour. I kept the trap for ten days and tried in several places and rat runs in the house.

In this place, there is a heavy population of *Rattus rattus* freely running hither and thither even during day time. When this is the case, the same Sherman trap which was successful to trap *Mus musculus* in Hyderabad City failed to catch even a single rat *(Rattus rattus)* in Vizianagaram.

This observation leads me to think that the odour of House mouse *( Mus musculus )* is either offensive or repulsive to *Rattus rattus*.

## Tolerance of Roof rats (*R rattus*) to the anticogulant rodenticide Coumachlor

**K. Muktha Bai, M.K. Krishnakumari and S.K Majumder**
Infestation Control & Pesticides Discipline,
Central Food Technological Research Institute, Mysore-570013, India

Roof rats ( *R. rattus*) ware trapped from a village which was 11 Kms. from Mysore and where poison baiting (using 0.025% coumachlor) was carried out earlier as one of the control measures for a period of 115

days. They were brought to the laboratory, weighed, sexed released into individual cages, and fed with 0.025% coumachlor for 7 days. The rats were then observed for symptoms and mortality for a further period of 60 days during which time, they were given normal diet and water *ad libitum*. The results obtained showed that out of eight rats tested, only 3 rats succumbed on 26th, 32nd and 40th day which had consumed 194.0, 171.0 anb 117 mg/kg. b.w. of poison respectively. The survivors, though consumed an average of 120 mg/kg. b.w. of poison, did not show any symptom or sickness when observed further. Cage trials with roof rats (not exposed earlier to the anticoagulant ) although resulted in only 53% mortality, the rats succumbed between 5–50 days of feeding the poison bait.

The above findings point out that

1. There appears to be natural/ physiological tolerance existing already among the rodent population and hence, always poor control is reported for roof rats with coumachlor.
2. A longer period of poison bait exposure to the rodent population might induce tolerance (as indicated by the longer time taken to succumb by the rats exposed to anticoagulants) and hence, we have to restrict the period of poison baiting depending upon the anticoagulant used.

## Efficacy of wooden cage traps in field rodent collection

**S. C. Pasahan and Vinod Pal Sabhlok**

Haryana Agricultural University, Hissar-125004

Gangwa village of Hissar (Haryana) was selected for field rats collection and area of about 100m² comprising mainly the sand dunes lined by wild vegetation (*Aerva tomentosa, Zizyphus nummularia, Achyranthus asper*), was marked. It was highly infested with a very large number of beautifully oriented rodent colonies so much so that some of the locations were noticed infested to such an extent that the whole surface was found to be totally porous. Trapping of field rodents was tried with wonder traps for about 30 days during the months of November-December, 1980 at different locations in this area. Each trial involved two days' prebaiting on a mixture of nutritive diet but it was quite surprising that not even a single rodent was trapped The latter, no doubt, were noticed feeding upon the bait during prebaiting period. Moreover, in a few instances they were found making their burrow openings beneath the trap, thereby, facilitating their feeding on bait from outside the trap.

After having a sad experience of no catch for about a month, we placed along with these wonder traps 15 nos. of simple wooden cage traps manufactured in the same village available at the cost of Rs. 2.50/trap. Chapaties prepared in musterd oil were suspended in each of them. Interestingly enough, only the next morning 10 out of 15 wooden cage traps were found containing *6 Meriones hurrianae, 3 Tatera, and 1 Mus musculus*. This shows that wooden cage traps are more effective and definitely having an edge over the wonder ones. Their use is much more economical as they do not involve any prebaiting.

## Multiple choice test with three acute rodenticides against Black rat, *Rattus rattus* (Linn.)

**Ranvir Pahwa, R.B. Doharey and B.K. Varma**

Indian Grain Storage Institute, Hapur-245 101 (U.P.)

A multiple choice test with three acute rodenticides was carried out against black rat. *Rattus rattus* (Linn.) in the laboratory. The rodenticides tested were zinc phosphide, RH- 787 (Vacor) and silmurin (percent technical at the concentrations of 2% 1% and 7.5% (0.75% scilliroside) respectively. The baits were mixed with wheat flour adding sugar and oil for palatability.

Table—1 Multiple choice test with three acute rodenticides against *Rattus rattus*

| Sl. No | Weight of the rat (g) | Sex | Poison bait consumed by the rat (gm) | | | Time to death (hrs.) |
|---|---|---|---|---|---|---|
| | | | Zinc phosphide | Vacor | Silmurin | |
| 1 | 106 | M | 0 | 1.7 | 0 | 17 |
| 2 | 110 | M | 0 | 0.5 | 0.2 | 17 |
| 3 | 120 | M | 0.5 | 1.0 | 0.3 | 20 |
| 4 | 195 | M | 0 | 4.2 | 0 | 16 |
| 5 | 165 | F | 0 | 4.0 | 0.5 | 48 |
| 6 | 150 | F | 0 | 3.9 | 0.2 | 17 |
| 7 | 175 | F | 0 | 2.2 | 0.7 | 17 |
| 8 | 105 | F | 0 | 0.6 | 0 | 16 |

Three bowls each containing 8g of the bait prepared from the above mentioned rodenticides were given at a time to individual captive rats which were starved for 24 hours. Comparative preference of poison bait was assessed by the consumption of bait by the rats (Table 1) which indicates that they preferred vacor bait. However, five of them also consumed silmurin and only one tasted zinc phosphide bait. All the rats died within 16 to 48 hours after eating the poisoned bait.

## Integrated rodent pest management

**S.M.A. Rizvi, S.P. Gupta and R. A. Singh**

N. D. University of Agriculture & Techonology, Faizabad-224001

Encouraging results were obtained during a rodent control campaign made recently (second fortnight of November, 1980) at Crop Research Station, Masodha, N.D. University of Agriculture & Technology, Faizabad. Chemical and mechanical methods were suitably integrated to kill/trap the maximum number of rats in the total area of 98 acres. Poison baiting by Zinc phosphide was followed by fumigation of burrows by Aluminum phosphide. Later on water was poured in the remaining burrows and rodents coming out of these burrows were finally trapped with the help of cans. The number of rats killed/trapped by different methods were as follows :—

| Sr. No. | Method | No. of rats killed/trapped |
|---|---|---|
| 1 | Poison baiting (Zinc phosphide) | 41 |
| 2 | Fumigation (Aluminum phospide) | 92 |
| 3 | Mechanical (trapping) | 180 |

As evident from the above table, mechanical method was more effective followed by fumigation and poison baiting.

Since a light irrigation is generally required for the field preparation of *Rabi* crops, rats coming out of burrows may be easily trapped by the farmers. As regards burrows near the bund, fumigation and poison baiting can be quite effective. It is therefore, suggested that the integration of these methods can effectively manage the rodent pests during the period between *Kharif* harvest and *Rabi* sowing. This will also facilitate killing of litters and checking future multiplication of rats.



## Rodents predating upon locust and grasshoppers

**D. R. Parihar**

Central Arid Zone Research Institute, Jodhpur

During 1977 and 1978 while estimating the population of desert locust and grasshoppers at Beechwal (Bikaner) in Western Rajasthan, it was observed that the two gerbils, *Meriones hurrianae* and *Tatera indica* were predating upon them. The insects which were being predated were: Desert locust, *Schistocerca americana gregaria* and grasshoppers, *Heterocris littoralis, Ochrilidia affinis, Cyrtacanthacris tatarica, Pyrgomorpha bispinosa deserti* and *Acrotylus humbertianus*.

Even the slight movement of the grasshopper was noticed by the rodents and were attaked from the burrow opening, suddenly caught and the rodents seperated the head of the insect from body. The insects were eaten up within a short time Similar predatory behaviour was observed in captivity.

## Economics of rodent pest management in rural environment in Rajasthan

**Ranjan Advani and R.P. Mathur**

Central Arid Zone Research Institute, Jodhpur

As a result of three years of rodent control, extension and education work in the crop fields and threshing floors in the villages, the field rodent population was reduced by 95 per cent. The losses to various vegetables, wheat and bajra crops declined by 88 per cent. The cost benefit ratio was worked out to be 1 : 900. However, in the residential premises, the rodent population was reduced by 85 per cent with a corresponding decline in losses to stored grains, vegetable etc. and the cost benefit ratio being 1 : 220.

## NOTES AND NEWS

Apex Level Training for Rodent Pest Management is being organised during this summer at the following centres for the officials of the States and Union Territories mentioned against each.

| Centre | State/Union Territories to be covered |
|---|---|
| Jodhpur (Central Arid Zone Research Institute) | Rajasthan, Haryana, Punjab and Delhi |
| Hyderabad (Andhra Pradesh Agricultural University and Central Plant Protection Training Institute) | Andhra Pradesh and Madhya Pradesh |
| Parbhani (Marathwada krishi Vidyapeeth) | Maharashtra, Goa, Daman and Diu, and Nagar Haveli |
| Cuttack (Central Rice Research Institute) | Orissa, Bihar and West Bengal |
| Shillong (ICAR Agricultural Complex) | Assam, Arunachal Pradesh, Nagaland, Manipur, Tripura, Meghalaya, Mizoram and Sikkim |
| Hapur (Indian Grain Storage Institute) | Uttar Pradesh, Himachal Pradesh and Jammu & Kashmir |
| Mysore (Central Food Technology Research Institute) | Karnataka, Kerala and Tamil Nadu |
| Sidhpur (Rodent Centre) | Gujarat |

The next issue will appear in May , 1981. Contributions 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