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Notes on the species of the genus *Mus* in West Bengal

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The genus *Mus* is well represented in West Bengal but information on the species and their distribution appears to be erroneous as per records available in literature. The House mouse, *Mus musculus* is represented by two subspecies, *viz.*, *Mus musculus urbanus* Hodgson and *Mus musculus homourus* Hodgson. The race *Mus musculus urbanus* is an indoor type and is distributed throughout West Bengal in urban as well as in rural areas. It rarely burrows and has never been found from the burrows in the cultivated fields. The other race *Mus musculus homourus* is an outdoor type and has so far been recorded from Darjiling district of West Bengal. There is not much of information available on its habits, habitats, etc., which requires further investigation.

The Little Indian field mouse, *Mus booduga booduga* (Gray) is found generally in the rural areas of West Bengal. The cultivated fields are heavily infested by this rodent pest specially during dry harvesting season. During rainy season when the cultivated fields are inundated it shifts from low lying cultivated fields to the level above the water-mark. Generally bunds, high lands or hamlets of the rural areas become their temporary abode. It prefers hamlet to concrete building for its temporary shelter and makes burrows in cultivated fields, bunds, mud walls and also floors of the hamlets.

The Fawn-coloured mouse, *Mus cervicolor cervicolor* Hodgson is found in the rural areas of West Bengal affecting the cultivated fields. Its habitat and distribution are like those of *Mus b. booduga*, and population as compared to *Mus b. booduga* is far less in this State.

Occurrence of ventral marking gland in *Gerbillus gleadowi*

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Earlier the occurrence of the ventral marking gland was not reported in *Gerbillus gleadowi*. In a recent collection of this species from Mahendragarh (Haryana) the gland was found to be present in a male gerbil (length 18 mm and width 4 mm). The ventral marking gland is being reported for the first time in *G. gleadowi*.

Monthwise body-weight variations in *Bandicota bengalensis* (Gray) in the fields of PAU, Ludhiana

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Individuals of *B. bengalensis* trapped in PAU fields at Ludhiana were weighed from November, 1976 to October 1977. Monthwise mean body weight of males and females was recorded.

The mean body weight of the males was observed to be greater than that of females throughout the year, except in the months of February, October and December (Table 1) Overall mean population weight is low in the month of January (119.75 g). This may be due to lack of food in the fields in this month and high metabolic rate at low temperature. From February to May, the increase in mean body-weight may be attributed to the availability of more food as wheat crop was at its maturity. Decrease in the mean body weight in June and July appears to be due to trapping of youngones of less weight along with adults. From July to September increase in mean body weight may possibly be because of the grown up youngers.

Table 1 Monthwise mean body weight (g) variation in *B bengalensis* (Gray)

Month	Mean body wt. (g) Male	Female
January	121.5	118
February	130	140.83
March	219.33	194
April	228	179.5
May	279.66	234
June	205.5	170.5
July	200.42	158.25
August	225.7	182.3
September	221.37	220.9
October	138.66	204.1
November	162.8	152.1
December	138.8	175.00

Surface activity hours of a nocturnal desert rodent during winter

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The activity hours, in the natural environment, of a nocturnal desert rodent, the Indian gerbil, *Tatera indica indica* Hardwicke was determined by a simple mechanical device during winter (February, 1980). The average time spent outside the nest by this species during an eight day study period was found to be 318 minutes per 24 hours. Surface activity of this gerbil usually starts around 1900 and ends around 0300 hours (Table 1), with two peaks of activity between 2100-2200 hours and 0100-0200 hours. More than 10% of the daily activity period of this gerbil would seem to fall between 0100-0300 hours. Both before and after the major activity periods, several short term movements in and out of the system have been observed. Although its significance is not clear, it may probably be due to the gerbil's anxiety in ensuring that no predators are around when it is foraging or resting.

Table 1. Total time spent outside the nest (minutes day^{-1}), and begining and end of major activity periods, recorded for eight days in the Indian gerbil *Tatera indica indica* Hardwicke.

No. of observation	Major activity Begining (Hrs.)	End	Total time spent outside nest minutes day^{-1}
1	1915	0255	370
2	1930	0325	460
3	1920	0305	230
4	1915	0240	230
5	1855	0200	385
6	1910	2420	350
7	1930	0310	275
8	1845	0210	245
		Mean	318

New breeding technique for mass culturing the lesser Bandicoot, *Bandicota bengalensis bengalensis* Gray in captivity

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Numerous attempts to breed captive female *B. bengalensis* were unsuccessful (Spillett, 1966). Workers at the Haffkine Institute, Bombay and the Virus Research Centre, Poona were also failed to mate captive *B. bengalensis*. After many unsuccessful efforts a new breeding

technique for mass culturing the lesser Bandicoot, *B. b. bengalensis* under caged conditions has been evolved and standardised which embodies the idea of rearing the youngones belonging to the same litter alongwith their mothers till the age of maturity. The adult produced in this way live together amicably without showing any aggressive behaviour among themselves. This technique can also be successfully applied when the youngones of a litter brought directly from the fields and are reared under laboratory conditions with a nursing female, the adults thus developed also do not show any aggressive behaviour among themselves. The essential point in this technique consisted of selecting and keeping the males and females from litters of one and the same age group, bred or reared under laboratory conditions and allowing them to mate and live together.

Mating behavior, gestation period and breeding season of the lesser Bandicoot, *Bandicota bengalensis bengalensis* Gray

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Studies on the estrous cycle of female *B. b bengalensis* indicated that it came into heat every 4-5 days. Mating usually took place during night between 12 p. m to 3 a. m. outside the burrows in breeding cages. Sometimes, they were also observed to mate during day hours when males were released with the females after long separation. Courtship continued from 13-20 minutes. The gestation period varied from 22-25 days. The female *B. b. bengalensis* bred twice a year under laboratory conditions i. e., February-May and September-November.

Laboratory studies on oil preferences in predominant murid species of Hissar (Haryana)

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The field collections in Gangwa village of Hissar revealed *Tatera indica, Meriones hurrianae* and *Mus musculus* to be common rodent species. Oil preferences were studied under confied conditions to select the most preferred additive to be used with bait material for successful control of these rodents Food consumption was studied by single choice, bi-choice and multi-choice methods and each choice test ran for a week. Coarsely grounded gram, soyabean and maize mixed in equal proportions, formed the constant ingredients of food tested (control diet). The oil used for evaluation were groundnut, coconut, mustard and gingely.

Of the three species, *T. indica* and *M. musculus* revealed oil preference in the following order :

Groundnut oil > Gingely oil > Mustard oil > Coconut oil. 4-5% concentration of groundnut oil was found to be most preferred. Interestingly, *M. hurrianae* did not prefer any oil than the control diet ($P < 0.05$).

Nitrogen application enhances rodent population

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A survey conducted around Jui canal (Haryana) indicated high rodent burrow intensity in helds treated with nitrogenous fertilizers. Number of rodent burrows per field was low (6-11) where no fertilizer was applied (N_2 0.037 to 0.048%); 18–25 burrows in natural manure treated fields (N_2 0 25 to 0.36%); and 37–42 burrows in artificial fertilizer treated fields (N_2 0.40 to 0.42%). Even more burrows were recorded in uncultivated fields having silage (N_2 0 3 to 0 39%). More rodent infestation in fields treated with rich nitrogen fertilizers is expected as rich nitrogen ensures good and healthy crop which can sustain high rodent density.

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Feeding of *Rattus rattus* in an ultrasound environment

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Effect of the ultrasonic device manufactured by Oriole Services & Consultants Private Limited, Bombay-86 was tested on the food consumption of *Rattus rattus rufescens* in laboratory. Test animals

were ten each of young male, adult male and adult female. They were individually caged and oriented to laboratory conditions for a week. Later, weighed quantity of bajra *(Pennisetum typhoides)* was provided an l consumption was recorded for 24 hours. Water was always available to them. Later on, the ultrasonic instrument, hanging from the ceiling to cover all the cages, was operated all the 24 hours till the termination of the experiments (6 week). Results indicate that a) there was no difference in relative consumption of food (g/100 g body weight) between control and when the animals were subjected to ultrasonic sound (Table 1), b) with the operation of this device all the animals were observed to huddle in the corner of cages, c) males appear to be relatively affected more by this device than females as to young and one adult died during second week of experimentation and another adult died during 3rd week. No female died during the course of this study.

Table : Relative food consuption by *Rattus rattus* on various frequencies in an ultrasonic environment.

Frequency	Mode of operation	Average consumption g/100 g body weight		
		Young males Body weight (67 8g)	Adult males Body weight (90.0g)	Adult female Body weight (78 8g)
18 KHZ	Continuous	4.49	3.80	3.82
	Pulsed	6.01	3.97	4.43
19 KHZ	Pulsed	3.53	2.86	4.06
20 KHZ	Continuous	4.05	4.35	4.48
	Pulsed	4.57	4.15	4.56
Control	—	4.37	3.57	4.05

Encapsulated Zn_3P_2 baits for control of Field Rodents in moist fields

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Conventional Zinc Phosphide baits both in form of flour pellets encapsulating poison or oil coated grains dusted with Zn_3P_2 show fast degradation, poor acceptability and poor efficacy especially in moist fields. Studies revealed that Gram cultures under breeding programmes having early podding are cut by field rodents and pods are gnawed for grains. The damage considerably hampere evaluations in plant breeding programmes. So control of rodents was undertaken with conventional baits, pellets wrapped in old newspaper and inserted in active burrows in & around Bengal Gram fields. These baits showed poor efficacy. Further observations confirmed that dominant group are *Bandicota* spp. and *Nesokia* spp; active burrows per 100 m. transact ranged to 30 on bunds, 15 on bordering field road and 6 on adjoining fallow field under preparation. Estimated burrows within field ranged to an average of 178/ha.

Evaluations of acceptance, prefeence and efficacy under field conditions were undertaken in randomised and replicated trial by providing baits in natural habitats. Lack of freshly excavated soil was taken as index to efficacy of poison baiting.

Prebait acceptance with single choice tests (with sugar & coconut dust as attractant) was 75% to Gram flour; 40% to wheat flour and 20% to maize flour. When only wheat flour pellets were provided, acceptance was 50% on first day and nil on succeeding days. With multiple choice tests, acceptance was 25% to pellets of Gram flour, 10% to Maize Flour pellets and none to wheat flour pellets. Growth of fungus, *Aspergillus* spp. on baits laid on moist fields was 40% on Wheat flour pellets, 40-50% on Maize flour pellets and 3% on Gram flour pellets. Plain wheat flour pellets with protective paper wrappings/covering showed varied acceptance, namely 41% to old newspaper, 25% to yellow paper, 2% to green paper, zero to those dyed with Genetian Violet (acts as a weak fungicide, bactericide & ground eating birds do not pick), 50% to baits in gelatin capsule against 58.33% to plain pelletised baits. Capsule baits were bitten and upto 50% contents were eaten. Since capsuled baits show less degradation and acceptance was quite close to plain pelletised baits, further evaluations of capsule or encapsulated baits was undertaken. Treatments comprised Zn_3P_2 baits in concetration of 2.5%, 2.0% & 1.0% each with two main treatments of carrier-wheat flour and gram flour but outer coating of wheat flour, wheat plus gram flour (ratio 1:1) and gram flour. Studies revealed that irrespective of Zn_3P_2 concentration, the wheat flour pellets were less preferred or accepted. Baits coated with wheat and gram flour pellets showed 66.7% acceptance. Baits coated with gram flour showed 33.3% acceptance and within the treatment maximum acceptance was 67.0% to pellets with Zn_3P_2 in concentration of 1.0%. Succeeding final baiting with encapsulated baits of 2% concentration with outer coating of wheat and gram flour showed 96.0% acceptance and no active burrow was found in the area of baiting. Thus encapsulated baits appear to hold promise especially for moist or fields to be irrigated. ■

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NOTES AND NEWS

ICAR is organizing a National Seminar on Rodent Research and Control in collaboration with the Rodentological Society of India during February, 1982. The venue is Central Arid Zone Research Institute, Jodhpur.

Shri Girish Chopra was awarded Ph. D. degree by the Punjab Agricultural University, Ludhiana on his thesis entitled "Studies on the ethology and control of *Rattus meltada* Gray in Punjab".

Dr. A. M. K. Mohana Rao, Research Associate at the Coordinating and Monitoring Centre for Rodent Research and Training, Jodhpur has joined as Junior Rodent Specialist at Central Plant Protection Training Institute, Hyderabad.

The next issue will appear in Nov., 1981. Contributions for inclusion in the Newsletter may please be forwarded to :

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