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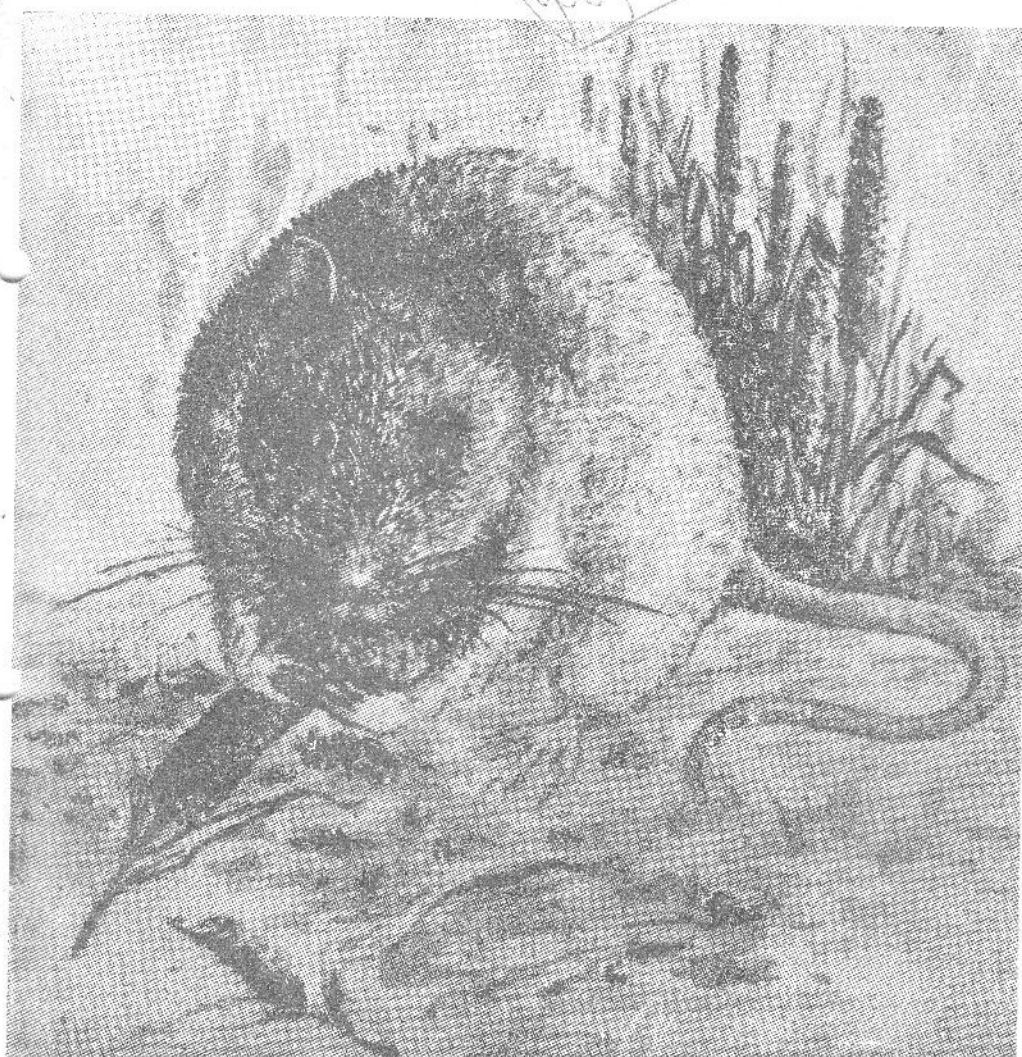

ALL INDIA COORDINATED RESEARCH PROJECT
ON RODENT CONTROL

Central Arid Zone Research Institute, Jodhpu

Rodents from Dhulia district, Maharashtra State

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Attempts were made to collect rodent specimens from twenty four different localities during the span of twenty one days' survey in November 1985 from Dhulia district situated in the northern most part of Maharashtra State. Methods of trapping (Wonder, Sherman and breakneck traps) near the residential areas, excavating the live burrows and upturning the heavy boulders in the field were used for the purpose. The following rodent species were collected.

Rattus rattus rufescens (Gray)	Trapped near the residential areas and foodgrain godowns.
Bandicota bengalensis kok (lordi) (Gray)	Caught by excavating the live burrows in the multiple crop cultivated fields.
Bandicota indica indica malabarica (Shaw)	Caught in small mammal trap from the burrows near garbage in the vicinity of human settlements.
Mus musculus castaneus Waterhouse	Sighted in the residential areas of Dhulia city.
Mus booduga booduga (Gray)	Caught live from the cultivated fields.
Mus dunni Wroughton	Caught live from burrows in the forested areas.
Mus (Pyromys) platythrix Platythrix Bennett	Caught from the forested areas cleared for agricultural purpose.
Golunda ellioti gujerati Thomas	Caught from the cultivated fields near a hill range covered with bushy forest.
Tatera indica (Hardwicke)	One dead specimen was noticed near cultivated fields grown along the Western Ghat ranges.

Funambulus pennanti Wroughton	Number of squirrels were noticed moving on the fig trees along the highways.
Funambulus t. tristriatus (Waterhouse)	Shot from a dense forested area along a small river.
Hystrix indica Kerr	A live hideout of porcupine was sighted in one of the ranges of Western Ghats. Fresh marks of the claws and number of spines were sighted near the entrance.

Population dynamics of Rodent pest complex at Dalip Nagar farm, Kanpur (U.P.)

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Dalip Nagar farm is situated about forty five kilometres away from the main campus. Farm land constitutes of reclaimed Ushar soil. The cultivated area is about 72 hectares where addy, maize, jowar, sugarcane, potato, mustard and wheat are grown.

The area was surveyed for two consecutive crop seasons during 1985-86. The rodent population was recorded by random digging of burrows all over the crop growing areas at the farm. The animals thus collected were identified and counted.

Table : Species composition and relative abundance of rodents in entire farm area at Dalip Nagar, Kanpur (UP)

Rodent species	No. of rodents collected		Relative % occurrence	
	Kharif	Rabi	Kharif	Rabi
Bandicota bengulensis	7	23	9.33	42.59
Tatera indica indica	12	6	16.00	11.11
Millardia meltada	34	15	45.33	27.77
Mus booduga	22	10	29.33	18.51

The data envisage that during kharif season the predominant species on the farm was *Millardia meltada* followed by *Mus booduga Tatera, indica* and *Bandicota bengalensis.* However, species composition during rabi

season showed a reverse trend; *B. bengalensis* which was in minimum number during early kharif season assumed the status of predominant species, whereas *M. meltada* occupied second position which was followed by *M. booduga* and *T. indica*.

Distribution of rodent population in different soils

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To study the habitat of rodent species with respect to type of soil, investigations were carried out in areas of Bharatpur district. The burrows were first located in the field selected randomly and then sealed with calcium carbonate. The burrows found open the next day were identified as live burrows. The species were identified by digging out the burrows and collecting the rodents.

Results indicate that maximum infestation was found in sandy soil followed by clay soil and least in saline soil. Predominant species in sandy soils were *Meriones hurrianae* and *Tatera indica*, in clay soil *Mus booduga* and *Rattus meltada* and in saline soil *Bandicota bengalensis, Rattus meltada, Golunda ellioti* and *Mus booduga* in order of prevalence.

Table : Live burrows of rodents in different types of soils.

Type of soil	Number of live burrows*/ha						Total number of live burrows/ha
	M.h.	T.i.	M.b.	R.m.	B.b.	G.e.	
Sandy	33	21	—	—	—	—	54
Clay	—	—	15	25	—	—	40
Saline	—	—	4	5	7	3	19

*Data were collected during the harvesting period in 1986 and 1987.

Identification of plant species in stomach contents of the Indian Gerbil, *Tatera indica* Hardwicke

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Stomach contents of 30-50 samples were analysed during each season, viz., summer, monsoon and winter for the identification of different plant materials. The identification of the plant species is based on epidermal characters.

Grass species like *Cenchrus ciliaris, Lasiurus sindicus, Panicum antidotale, Cynodon dactylon;* top feed tree species like *Prosopis cineraria* and *Zizyphus nummularia;* rhizomes, stems and seeds were found in the stomach of rodents during all seasons. Percent frequency of occurrence of all the plant species during different seasons has been shown in Table 1. Frequency of occurrence of different plant parts indicated that rhizomes are liked in summer and seeds are apparently preferred during winter. However, during monsoon season all the different plants parts are consumed more or less in similar frequency by the gerbils. Stem and leaves are eaten all the year round.

Table 1. Percent frequency of various grass and tree leaves, rhizomes and stems and seeds in the stomach of *Tatera indica* during summer, monsoon and winter seasons (Mean ± SE)

	Plant species	% frequency (summer)	% frequency (monsoon)	% frequency (winter)
1.				
	A. *Prosopis cineraria*	2.0±1.2	7.3±1.7	20±0.0
	B. *Zizyphus nummularia*	4.0±2.9	2.8±0.4	11.7±5.25
	C. *Cynodon dactylon*	5.0±2.8	15.0±0.0	15.0±7.6
	D. *Lasiurus sindicus*	5.6±2.1	11.5±2.9	4.7±2.9
	E. *Panicum antidotale*	5.8±1.9	4.0±0.6	NIL
	F. *Cenchrus ciliaris*	6.0±2.9	10.0±3.9	3.3±0.9
2.	Rhizomes + stems	29.2±7.7	16.5±9.6	12.7±3.5
3.	Seeds	4.4±1.7	10.5±3.6	41.3±0.6

Rodent damage to ber and cashewnut trees

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Ber (*Zizyphus mauritiana*) and cashewnut (*Anarcardia occidentale*) are the fruit trees grown in south Gujarat. These fruit trees were found damaged by the rats during January-February 1988 at Fruit Research Station, Gujarat Agricultural University, Paria. The root zone around ber trees was found heavily ramified with rat burrows making the trees weak. The damage was to the extent of cent percent. In case of cashewnut, the damage was in new plantation (about $1^1/_2$ to 2 years old) and the tap root was completely gnawed leading to drying and uprooting of the plants.

As much as 10-12% damage was observed in this crop. The rodent damage in these two fruit crops was due to migration of rat population from preceeding groundnut crop cultivated in surrounding fields during July-October. The rodent species responsible for damage could not be identified but it was probably *Rattus meltada* or *Bandicota bengalensis*.

Assessment of hoarding losses due to bandicoot in wheat fields

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Rodents cause losses to standing crops by cutting the plants and dragging the food material into burrows. Besides cutting the plants, they also hoard the food material in their burrows for feeding. The present investigation was conducted to find out the hoarding losses caused by the lesser Bandicoot rat, *Bandicota bengalensis* in the harvested fields of wheat during April 1989. From each field 3 burrows were excavated randomly.

The mean number of burrow system/ha was 28. Out of 16 excavated burrows, 12 burrows had the hoarded food material and 3 burrows had the eaten up food material and straw only. The mean number of burrow openings in a burrow system was 8.25, while the mean number of storage chambers per burrow was 5.24 which included food, nest/breeding and empty. The mean number of food hoarding chambers in a burrow system was found to be 4.43. The average amount of hoarded material of wheat per burrow was 1.0 kg and the resultant hoarding wheat grain losses were found to be 8.04 kg/ha. The maximum grain hoarded was recorded to be 2.81 kg per burrow. The number of occupants, varied from 0 to 46 in the burrows. The ratio of youngs, male and female, was 4.1 : 1 : 1.4, respectively.

Losses by rodent pests in wheat crop

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The study was carried-out in five villages of Jaipur region. Five fields varying from 1.70 to 5.25 acres were selected. 'Tiller count method' was adopted for assessment of damage. In each field six plots, each of one sqm. were studied following a random sampling technique. Damage caused by rodents was recorded at different growth stages (Table 1).

Table 1. Losses in wheat crop due to rodents

Vegetative stage	Percentage losses ±S.E.	Cumulative losses (%)	Affected plots (%)	Range of losses (%)
Seedling	0.63±0.33	0.63	36.6	0-1.90
Tillering	0.80±0.22	1.43	43.3	0.18-1.70
Early jointing	1.60±0.29	2.03	70.0	0.68-2.42
Jointing	0.59±0.18	3.69	40.0	0.16-1.27
Late jointing	0.72±0.12	4.35	50.0	0.31-1.11
Flowering	0.53±0.19	4.88	40.0	0.28-1.39
Milk stage	0.39±0.10	5.28	36.6	0.10-0.68
Dough stage	0.40±0.15	5.69	30.0	0.05-1 03
Maturity	0.24±0.03	5.93	42.2	0.13-0.34
Total	5.93±0.52	—	43.2	4.26-7.51

At different stages the loss varied from 0.24 to 1.60 per cent. Maximum loss was observed at jointing stage (2.42 per cent).

This study reveals that rodents cause damage at every growing stage. Therefore, it would be desirable to organise rodent control campaign from the very beginning and must be completed before jointing and tasseling stages. Secondly, to control the pests at maturity stage, is nothing, but mere waste of power and material, because at this stage, maturing grains are more palatable and attractive than any other bait offered.

Advantages and disadvantages of Glue traps

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Glue traps supplied by M/s Ecosafe Traps (India) Ltd., were tested for their efficacy against commensal rodents. Recently, Tripathi *et al.* (1986) published an account on this aspect based on their experiments at Jodhpur, Rajasthan. One trap each was set in a house and four grocer's shop of Salt Lake, Calcutta area for seven successive nights. Some advantages and disadvantages of glue traps as experienced during the study are:

Advantages :

1. Very light and easy to carry. A good number of traps can be taken as a small bundle as in the case of sherman trap.
2. No bait is required and operation method is very simple. Any person can use it with single demonstration. It can easily be set on the rodent pathways at any position of the house or shop.
3. It is very safe for the children and there is no risk of contamination.

4. Very effectively control the rodent population in the houses and shops. In seven days operation with only five traps a total of 30 specimens were trapped (*Mus musculus*-20, *Mus booduga*-3, *Rattus rattus*-4, *Rattus norvegicus*-2, *Bandicota bengalensis*-1).

Disadvantages :

1. Though glue traps are said to be disposal type, but from the economic point of view, same trap is used for as many days as possible. To reuse the trap, removal of the trapped specimens is a must. A trapped specimens often remain alive (particularly *Rattus sp.* and *Bandicota sp.*). Removal of the specimen from the trap is a very difficult process for its firm attachment with the trap. Often the specimens are torn out during operation.
2. Specimens collected in glue traps are of no use for experimental, museum and taxonomic study purpose.
3. Trapped specimen are always to be buried. Specimen thrown in the field often become dangerous for the scavengers particularly birds. Glued specimens stuck to the body of the bird and often make them stranded.

Eco safe traps for controlling rodent pests

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Glue traps supplied by Ecosafe Traps (India) Ltd., Bombay were evaluated for their efficacy in food stores, house and other complex environments. These were laid on rodent runways and other places where the pests visited regularly.

Roof rat *(R. rattus)* and house mouse (*M.musculus)* come to the traps. However, mice were trapped more easily than rats due to their fast movement and less realization/suspicion of traps laid. In one trap a maximum of 14 mice were caught within 24 hours. Many a times, immediately after keeping the traps, mice were trapped. Comparatively, rats took little longer time to come to traps, and the maximum catch was observed when traps were left overnight and undisturbed. In premises where both the species coexisted, both were trapped on a single board. However, maximum removal of pests were seen only when the traps were laid in strategic places and in sufficient number for the first day. Subsequently, the numbers went on reducing.

Advantages : Does not require any food material or baits; surplus population can be eliminated almost immediately; no hazard of contamination or danger since it is non-poisonous; easy to locate the trapped/dead rodents, hence no danger of dead rat odour, lizards and other crawling insect pests also get trapped; elegant to look, safe to handle and easy to carry large numbers and very good in situations where poisons cannot be used.

Disadvantages : Only moving population can be removed; if traps are not secured properly chances of being dragged by bigger rats (when caught) and getting glued to other places; the suffering of trapped animals is much before they succumb and the trapps can be used for only one operation.

Non-food materials as carriers of rodenticides to control rodent pests

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Based on behavioural studies of rodents that these have to gnaw at materials to keep their incisors in size, and also sharp for their well being, a new approach has been made to utilize non-food materials as carriers of poison baits. Rats like or prefer to gnaw at materials of certain type only. This was studied thoroughly and found that "Thermocole" was best liked by them. Hence methods were standardized to incorporate various rodenticides into this and these were evaluated against different rodent species like *Rattus norvegicus* (albino), *Rattus rattus* (roof rat), *M. musculus* (albino) and Bandicoots, both under laboratory and field conditions. The results obtained have been very encouraging.

In view of the advantages of using non-food baits as carriers it was concluded that these types of poison baits could be used under various ecological conditions with much less caution and hazards to non-target species and for a minimal cost.

Evaluation of bromadiolone against commensal rats

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Field trials were conducted using 0.005 per cent Bromadiolone in Baraj village situated on Jaipur-Jobner road. The rat population in Katcha houses, pucca houses and shop cum godowns was determined to be 11. 84, 8.24 and 17.67 rats per premise, respectively. Bromadiolone (0.005%) was kept in sufficient amount in each house at different sites. From these houses 32 and 31 black rats (*Rattus rattus)* were trapped after 24 hours and 72 hours of the placement of poison bait, respectively. These rats were maintained in cages on normal feed and water till death or maximum up to 20 days.

Results indicate, 90.62 and 100 per cent mortality when the bait was placed for 24 hours and 72 hours respectively prior to trapping. In both the cases mortality began on 4th day with maximum on 6th and 7th day respectively. Time of death varied from 4 to 13 days (7.41 days on an average) and 4 to 11 days (6.58 days on an average), respectively. (Table).

Table : Toxicity of Bromadiolone (0.005%) against house rats

Day	After feeding bromadiolone bait for 24 hours		After feeding bromadiolone bait for 72 hours	
	No. of rats died	Progressive mortality (%)	No. of rats died	Progressive mortality (%)
4	2	6.25	3	9.67
5	3	15.62	7	32.25
6	5	31.25	10	64.50
7	8	56.25	4	77.41
8	5	71.87	3	87.09
9	1	75.00	—	—
10	2	81.25	1	96.77
11	—	—	—	—
12	2	87.50	—	—
13	—	90.62	—	100.00
14	—	—	—	—

Rodent control in the homesteads of Imphal, Manipur, using bromadiolone

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A homestead in State of Manipur is normally spread over 1-5 acre rectangular land surrounded by a compound of a row of bamboos planted on a raised bund. The number of kutcha houses in a homestead may vary. Each homestead has a kitchen garden, fish pond and a food-grain store on an elevated place. A variety of ducks and poultry are also reared. In homesteads, rodent inflict severe losses to vegetable crops of cabbage, potato, beans, peas, and knolkol.

In the present study three homesteads, were selected one each in the category where; storage of foodgrain is in excess of the annual requirement of the family (Site I); storage of food-grain is approximately equal to the annual requirement (Site II); and storage of food-grain is below the annual requirement (Site III).

Bromadiolone was evaluated between 12th March to 11th May 1985. Cracked cereals (wheat and rice) were used as bait material. Bromadiolone bait (0.005%) was placed at 50 points (15g bait at each point) on first day and replenished with same quantity on the 3rd and 5th day (Table 1). The baits were wrapped in a piece of paper and kept in the bamboo groves and along the regular pathways of rodent inside and outside the houses near storage structures and other places frequented by rodents. Observations were recorded upto 11th day. The number of dead rodents recovered during each baiting period counted and the rodent species were identified. It was observed that rodents started dying from the 2nd day after the treatment. Upto the 11th day, a total of 122 dead rodents were collected from the three sites. From the homestead having stored grain more than annual requirement (Site I), 47 dead rodents were collected whereas 39 and 36 rodents were collected from Site II and Site III, respectively. Maximum mortality occurred between 3rd and 5th day in all the categories. (Table 1). *Bandicota bengalensis* were 56.5% of the dead rodents followed by *Rattus rattus* (43.5%). Thus poison baiting on alternate days (1-3-5 day) checked the damage to the stored food-grain, vegetable crops and household commodities. However, during and after the poison baiting there was not a single incident of non-target toxicity or secondary poisoning, revealing that bromadiolone can be safely and effectively used against commensal rodents.

Table 1. Efficacy of 0.005% bromadiolone baiting against *Rattus rattus* and *Bandicota bengalensis* in the homesteads around Imphal, Manipur

Site Location	Baiting period* (days)	Dead rodents recovered		Total rodents recovered
		R.r.	B.b.	
I Larikyengbam Leikai, Imphal	1	1	2	3
	3	6	19	25
	5	11	4	15
	8-11**	3	1	4
II Sagolband Road Tera.Keithel, Imphal	1	1	0	1
	3	10	7	4
	5	7	9	16
	8-11**	2	3	5
III Larikyengbam Leikai, Imphal	1	0	2	2
	3	7	11	18
	5	5	9	14
	8-11**	0	2	2

* Poison baits were placed on 1st, 3rd and 5th day only.
** Only observations were recorded for dead rodents.

Evaluation of brodifacoum wax cakes against commensal rodents

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Trials were conducted to evaluate brodifacoum (0.005%) against *Rattus rattus* in laboratory and against *Rattus rattus* and *Mus musculus* in the houses.

Laboratory trials;

Rattus rattus were trapped from the grain dealers, shops in Hapur City. Rats thus trapped were kept separately in the laboratory in wonder traps and fed with normal diet for a week to get them acclimatized. Brodifacoum at 0.005% concentration was fed continuously to 10 rats while one rat was kept as control and given plain bait. Daily observations for consumption of bait and mortality revealed cent per cent mortality of test animals within 4-10 (mean 6.0) days with an average bait consumption of 44.17 g per 100g body wt of rats

Field trials:

Field trials were conducted in the houses of farmers in village Akrauli near Hapur. Before starting the field trial, rodent population was estimated which came to 4 per house (3 *Rattus rattus* and 1 *Mus musculus*). After this ready to use wax cakes formulation of brodifacoum 0.005% concentration

was placed in 75 houses continuously for 13 days. It was observed that on an average a rat consumed 26.29 gm of poison bait leading to 72.3% control success. In all 217 dead rodents were collected after the control operation.

Thus it can be concluded that brodifacoum wax-cake, a second generation anticoagulant rodenticide at a concentation of 0.005% is a very potent chemical against commensal rodents.

Bio-efficacy of brodifacoum wax block against some Indian rodent species

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The efficacy of brodifacoum, an anticoagulant rodenticide in the form of wax blocks at a concentration of 0.005% was evaluated against *Funambulus pennanti*, *Meriones hurrianae*, *Tatera indica*, *Rattus meltada*, *Rattus rattus rufescens* and *Mus musculus*. After single day exposure, the anticoagulant produced sickness symptoms in all the test species on the second day and mortality started from third day onwards. Cent percent mortality was recorded in all the test species except *R. meltada* which required atleast 2 days feeding period, the average days to death was observed to range from 5.0 to 8.5 days (Table). These results thus indicated great potentiality of wax block formulation of brodifacoum (0.005%) in containing the menace of field as well as commensal rodent pests.

Table : Efficacy of brodifacoum wax block against desert rodents (After one day exposure).

Species	Consumption (g) (Mean±SE)	Poison ingested (mg/kg) (Mean ± SE)	Mortality (%)	Days to death Average (Range)
F. pennanti	4.85±0.31	2.11±0.30	100	6.8 (4-9)
M. hurrianae	5.80±0.68	4.27±0.60	100	8.5 (5-15)
T. indica	10.7[1]±1.19	5.53±0.56	100	6.4 (4-10)
R. meltada	3.87±0.33	3.48±0.50	80	5.5 (3-10)
R. meltada (2 days exposure)	8.84±0.48	7.45±0.74	100	5.5 (4-9)
R. rattus	6.85±0.50	4.45±1.00	100	7.5 (4-13)
M. musculus	3.40±0.22	9.57±1.25	103	5.3 (3-7)

Laboratory performance of brodifacoum wax blocks in Indian gerbil, *Tatera indica*

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Brodifacoum wax blocks received from M/s Indian Explosives Limited Madras, were evaluated in the laboratory against *Tatera indica*. Gerbils were acclimatized for one week before poison baiting treatments. Wax blocks weighing 20 gm each were evaluated for one, two and three days exposure periods on a set of 8 gerbils. After the exposures, the animals were kept on normal food.

Table : Bio-efficacy of 0.005% Brodifacoum against *T. indica* in No choice test.

Poison exposure period.	Per cent mortality	Days to death Mean (Range)
1 day	87.5	7.57 (5-12)
2 day	100	6.37 (4-10)
3 day	100	6.25 (4-10)

It was apparent that wax blocks knocked down all the experimental animals in 2 and 3 days exposures within 4-10 days. It is thus obvious from the experimental findings that for achieving cent per cent kill of Indian gerbil, brodifacom should be exposed at least for two days.

Efficacy of Flocoumafen wax blocks against *Funambulus pennanti* in laboratory

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The squirrels, *F. pennanti*, trapped from pomegranate orchards were acclimatised in laboratory on pearl millet grains for 1,7 and 30 days. Flocoumafen wax blocks at 0.005% concentration were provided for one day to these test squirrels caged singly under no choice conditions. The results as shown in Table evidently proved single dose potency of this rodenticide against the Northern palm squirrels which are supposed to be a difficult species from management point of view. The acceptability of the poison bait was also fairly good. Amongst various periods of acclimatisation for testing the laboratory efficacy one week period was observed to be

Table : Efficacy of flocoumafen wax blocks (0.005%) against *F. pennanti* at one day exposure.

Acclimatisation period	Poison bait consumed (mean ± SE)	mg/kg of poison ingested (mean ± SE)	percent mortality	Days to death	
				Mean	Range
1 day	8.15±1.07	3.77±0.36	80%	8.2	6-13
7 day	9.25±0.62	4.86±0.33	100%	11.8	9-15
30 day	3.47±0.85	1.70±0.47	62.5%	9.2	6-13

the optimum (100% kill) followed by 1 day acclimatisation (80% kill) and 1 month acclimatisatoin (62.5%). The acceptance of poison bait after one month of pearl millet feeding was also poor resulting in reduced mortality. Hence flocoumafen wax block may be effectively utilized for management of Northern palm squirrels in orchards, kitchen gardens and crop fields.

Evaluation of Quintox baits containing Cholecalciferol (Vit D_3) against albino rats and mice

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Quintox pellets containing cholecalciferol (Vitamin D_3) were evaluated against albino mice of both sexes. The pellets were offered to them for one, two and three days respectively under cage condition. The experimental animals were observed for symptoms of sickness, mortality, etc. daily. The residues were collected, intakes were noted down to calculate the active ingredients ingestion. The number of animals used, exposure period, and mortality are expressed in the following Table.

	Sex and Av. body wt. (gms)		Exposure period (days)	Number Tested/Dead		Death time (days)
	Female	Male				
R. norvegicus	168	217	1	8	0	—
(albino)	168	210	2	8	4	5-14
	165	313	3	8	7	4-11
M. musculus	38	39	8	1	6	5-7
(albino)	37	40	2	8	8	5-11
	40	40	3	8	8	5-11

It is evident from the Table that albino mice were comparatively more susceptible to vitamin D_3 than albino rats. The death time was also less in case of mice (5-11 days) whereas in rats it was prolonged to 18 days. Hence Vitamin D_3 could be a useful rodenticide to kill mice, a difficult species to be controled by other rodenticides.

Studies on the efficacy of Bromadiolone and brodifacoum cakes to control house rats

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Indian Grain Storage Institute, Adhartal, Jabalpur (M.P.)

House Rats, *Rattus rattus* trapped from the houses were fed on wheat flour for two weeks to acclimatize them with new environment. Before initiation of experiment the test animals were allowed to starve for 24 hours and weighed individually, No choice and choice tests containing 12 rats each were carried out for the study.

In order to assess the efficacy of ready-to-use cakes of Brodifacoum and Bromadiolone, rat population of two villages was assessed individually by the catch, mark and release method. Thereafter ready to use poisoned cakes were placed in every house for three days only. Collection and disposal of dead rats in two villages were continued upto 15 days.

The mortality of rats in no-choice-test and choice test is given in Table 1. From the results, it is observed that both of the formulations cause 100% mortality within 5 to 12 days exclusively on poisoned cakes. The mean of poisoned cakes of Brodifacoum and Bromadiolone consumed was found to be 7.25 and 6.2 mg/kg of body weight, respectively. Brodifacoum cakes caused only 20% mortality. Bromadiolone cakes proved to be more acceptable than Brodifacoum cakes, as the former caused 60% mortality, in choice tests.

Table 1 Comparative toxicity of Bromadiolone and Brodifacoum cakes in laboratory.

Sl. No.	Treatment	Mortality %	Period required to cause death (days)		Poison consumed (mg./kg.	
			Range	Mean	Range	Mean
A.	No choice test					
1.	Brodifacoum cakes (0.005%)	100	6-11	8.7	2.2-10.8	7.25
2.	Bromadiolone cakes (0.005%)	100	5-12	8.5	5.9-9.3	6.20
B.	Choice test					
1.	Brodifacoum cakes and wheat flour	20	4-5	4.5	0.6-0.8	0.71
2.	Bromadiolone cakes and wheat flour	60	6-17	10.8	2.3-8.2	2.58

The difference in efficacy of the two posions Brodifacoum and Bromadiolone was also apparent when these two types of cakes were tested in controlling rats in dwellings of two villages. It can be observed from the Table 2 that Bromadiolone cakes caused 66.6% mortality of rats whereas Brodifacoum could kill only 17% of the total rat population where in addition to the position baits various other kinds of edible materials also become available to the rats.

Table 2 Effectiveness of Bromadiolone and Brodifacoum cakes against commensal rodents in houses.

Sl. No.	Name of the village & rodenticied under trial	Estimated rat population per house	Percentage of collected dead rats against estimated rat population
1.	Ghansaur block, Jabalpur (Bromadiolone cakes 0.005%)	6.0	66.6
2.	Khamod block, Patan (Brodifacoum cakes 0.005%)	8.0	17.0

NOTES & NEWS

Dr. P.K. Ghosh, Principal Scientist, CAZRI, Jodhpur, has taken over as Acting Project Coordinator, AICRP on Rodent Control, in February, 1990.

The Sixth Workshop of the All India Coordinated Research Project on Rodent Control was held at the Dept. of Entomology and Apiculture, Dr. Y.S. Parmar University of Horticulture and Forestry, Solan from April 17-18, 1990. Over 50 delegates from AICRP Centres, ICAR, Agricultural Universities, various Central and State departments and pesticide industries participated in the deliberations.

The International Rice Research Institute, Manila, organised a Panel Discussion on Rodent Control during 9-14 September, 1990. Dr. Ishwar Prakash, Prof. of Eminence, CAZRI, Jodhpur was invited to present the Key Note Address.

Dr. Ishwar Prakash, CAZRI, Jodhpur, has been awarded the Har Swarup Memorial award (1990) by the Indian National Science Academy for his outstanding work on rodents.

Contributions for inclusion in the Newsletter may please be forwarded along with 1-2 good black and white photographs to ;

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In view of the increasing cost of production, "Rodent Newsletter" will henceforth, be sent only to those recepient of this issue who would writ to us requesting for retaining their names in our mailing list.

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