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Rodents in the cultivated fields of West Bengal

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Our knowledge about the rodent species composition in various crop types of the country is meagre.

The author has studied rodents in cultivated fields at Singur, about 34 kilometers north-west of Calcutta in Hugli District, West Bengal. The species found at Singur are the Lesser Bandicoot Rat, *Bandicota bengalensis* (Gray), the Large Bandicoot Rat, *Bandicota indica* (Bechstein), the Little Indian Field Mouse, *Mus booduga* (Gray), the Fawn-coloured Mouse, *Mus cervicolor* Hodgson and

the soft-furred field Rat, *Millardia meltada* (Gray). Among these, the Lesser Bandicoot Rat, *Bandicota bengalensis* (Gray) is the most destructive and predominant (65%). These rodents are most destructive to field crops from October to March. The average destruction of paddy after harvest was found to be 300 kg per hectare at Singur. Besides paddy, they also destroy wheat, pulses and vegetables like potato, cauliflower, cabbage, brinjal, tomato, etc.

Rodent menace in water bunds

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Observations on the rate of rodent infestation in water bunds having 2 km length were made. Three Pucca water channels in Jui Canal, Bhiwani (Haryana) were under observations in which the burrow number ranged from 396 to 431, reflecting very high rate of infestation of rodents in a cultivated land. The water reaches to head, middle and tail ends within 2, 3½ and 6½ hours

respectively. When evaporation loss of water was taken into account, the leakage due to rodent burrows was calculated to be 60 per cent. Thus, the water which is used for irrigation purpose takes much more time in reaching the tail end of the fields. This seepage and leakage after some-time cause severe harm to these bunds used as water channels. This is a great financial setback to a farmer

for repairing these water channels. It is, therefore, desirable that this confined population of rodents should be managed by Aluminium phosphide fumigation.

Rodents in relation to soil texture

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In the present study five samples of each type of soil at Bhiwani (excavated soil, burrow soil, and the surrounding or normal soil) were collected during 1980 and analysed by hydrometer method. Relative proportions and percentages of sand, silt and clay were calculated by drawing the soil texture diagrams. It was found that *Meriones hurrianae*, *Tatera indica*, *Bandicota bengalensis*

and *Mus beoduga* preferred sandy, sandy loam, clay loam and sandy clay loam types of soils respectively. This study reveals that texture of the soil has a direct relationship with the habitat and distribution of rodent fauna in a particular area. With the change in the texture of the soil, burrowing animals tend to change their abode to suitable ecological niches.

Preference of the south Indian palm squirrel, *Funambulus palmarum* for dry baits

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The south Indian palm squirrel (*Funambulus palmarum* Linnaeus) is a predominant rodent pest of cacao (*Theobroma cacao* L.) in south India. Studies have been carried out in laboratory, using locally available

cereals (paddy, jowar, wheat, barley and finger millet) and pulses (cowpea and Bengal gram), to find out the best bait base for the control of this pest. The additive effects of oils, sugar and salt were also worked out.

The baits were exposed simultaneously and the amount of each bait consumed was taken as the criterion in giving ranks.

The south Indian palm squirrels consumed cereals in preference to pulses and finger millet was most

preferred, both as whole grain and as powder. Addition of oils, sugar and salt had no significant influence. The order of intake of different forms of the bait was : whole grain > whole grain + 2% sugar > flour > whole grain + 2% oil.

Study of food preference of *R. rattus*

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With a view to make rodent baits more acceptable the food preference of *Rattus rattus* was studied, as this species of rat is very common here. The foods screened were: wheat grain, flour, maize, soyabean, pulses, rice, gram, sugar, jaggery, ghee, salt, mustard oil, milk and water.

A measured quantity (50 g.) of each food item was taken in different petri dishes. Three replications of each food were used. The rat was kept without food for 24 hours in a cage prior to being left in a large wire meshed cage where all the foods were kept. The quantity of each food was measured after three

days. The difference in weight showed the amount of food taken by the rat during these days. Among liquid foods it preferred milk and water. Among solid foods it took a maximum amount of rice. The other foods it preferred were sugar, maize, soyabean and gram; in the descending order. The experiment was repeated three times with different rats. The results turned out to be the same. So it is concluded from the experiment that in this paddy growing area rats, *R. rattus* prefers rice as the main food, since it is easily available to them.

Occurrence of mid-ventral marking gland in the little gerbil, *Gerbillus nanus indus*

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Eight little gerbils (*G. n. indus*) collected from Jodhpur were examined for the presence of mid-ventral scent marking gland. All the six males possessed them whereas it was absent in the two females. The size

of the gland in *G. n. indus* is fairly large (length 8.16 mm. \pm 0.06 and width 3.00 mm.) when compared to that of Indian gerbil, *Tatera indica* but is smaller than that in *Rattus*

meltada pallidior and *Meriones hurrianae*. Further work on the functions of the mid ventral marking gland is in progress.

Efficacy of WBA 8119 (brodifacoum) to Indian rodents

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The efficacy of brodifacoum anticoagulant rodenticide against (3-(3 (4'-bromo biphenyl-4-yl)-1, *Funambulus pennanti*, *Meriones* 2, 3, 4-tetrahydronaphth-1-yl)-4-hydroxy coumarin) as an acute *gleadowi*, *Rattus gleadowi*, *R. meltada*, *R.*

Table 1. Efficacy of 0.005% brodifacoum to various rodent species

Species	Feeding period (days)	% mortality	Average poison ingested (mg/kg)	Average days to death
				Mean (Range)
<i>F. pennanti</i>	1	66	3.06	7.6 (6-12)
	4	90	10.26	9.7 (6-12)
	6	100	19.66	8.7 (4-13)
<i>M. hurrianae</i>	1	83	3.06	8.0 (3-12)
	3	100	5.68	6.6 (4-12)
<i>T. indica</i>	1	90	1.41	6.9 (3-11)
	3	100	12.06	6.6 (3-12)
<i>G. gleadowi</i>	1	60	4.19	6.6 (3-12)
	3	100	8.28	5.0 (3-7)
<i>R. gleadowi</i>	1	33	3.47	3.5 (3-4)
	2	100	9.56	100 (4-10)
<i>R. rattus</i>	1	83	3.77	8.0 (4-11)
	2	92	8.92	7.5 (4-12)
	4	100	11.49	7.1 (3-13)
<i>M. musculus</i>	1	60	4.44	4.6 (4-6)
	3	80	9.91	3.8 (3-5)
	5	100	8.25	3.9 (2-7)

rattus and *Mus musculus* at 0.005 per cent concentration is reported. The anticoagulant treated bait was exposed in 'no-choice' feeding test for a fixed period ranging from 1 to 5 days. It was observed that 66, 83, 90, 60, 33, 80, 83 and 60 per cent mortality

in respective species occurred when the bait was exposed only for a day (Table 1). The complete kill among these rodent species was observed when the bait was exposed for 2-6 days except to *R. gleadowi* (Table 1).

A Brief Report on 'Rodent Control Week' organised by the Indian Grain Storage Institute and Save Grain Campaign Offices, of the Department of Food (Government of India)*

The seventeen Save Grain Campaign Offices and three Indian Grain Storage Institute Offices, in collaboration with different State Govt. organisations, have been organising a 'National Week on Rodent Control', every year, especially in the post-harvest periods, to carve out an impression and awareness among the farmers in particular and the people in general all over the country so as to launch a crusade against their mounting menace.

The very idea of such weeks is to educate and motivate farmers, traders and other concerned to understand the menace/damages caused by rats, their behaviour and also how to prevent and control rats. They are taught and demonstrated as to how observance of good hygiene and non-availability of food, water and shelter to rats can be

deterimental in prevention and control of perhaps the greatest enemy of human beings.

During April-May 1980, 673 villages in 74 distts. were covered under intensive rat control campaigns in the houses as well as in fields by these Offices. In as many as 49,105 farmer's houses, demonstrations for control of rats using chronic poison viz. warfarin, and acute poison like Zinc phosphide, were given. As a result 7,52,113 rats were found dead in the vicinity of so operated villages. After having waked out the manpower available and the requirement of rodenticides etc. in relation to the target area and forming the teams of volunteers to operate in different sectors demonstrations, in an area of about 39,000 hectare were arranged to show as to how rat control operation at Community level in the fields can be undertaken.

*Communicated by Dr. K Krishnamurthy, Jt. Commissioner Deptt. of Food, Krishi Bhawan, New Delhi.

During the course of demonstration as many as 1,25,705 rat burrows were fumigated with Aluminium phosphide pellets and treated with Zinc phosphide by way of torpedo baiting. In addition to these curative steps, demonstration on preventive measures as how to make houses storages structures/premises rat proof, were also imparted. 54 houses were rendered rat deterrant by metal sleeving on the doors.

Training courses to educate farmers and small traders on the prevention of food losses were also arranged. In 76 non-stipendiary training programmes, as many as 5573 target persons were trained. The entire programme was given a wide publicity through various mass media. 77 radio talks on rodent control were delivered from different station of the AIR all over the country. 64 film shows & 17 slide shows on

rodent control were organised where more than 8,000 persons got benefited. 560 persons participated in 23 seminars showing various aspects of rodent behaviour and their control. During the period 37 exhibitions were arranged and these were visited by as many as 16,345 persons. 152 Krishak charchas / Goshties were also organised where more than 500 persons took part. Slogans highlighting the detrimental role of rodents to human-beings and stored foods were written on the walls at 2451 sites. Semi-technical literature in the form of pamphlets / leaflets handbills etc. in simple local language were also distributed to educate as many as 16,000 persons. To record the over all activities during the week, 52 press notes were released in national and local news papers in Hindi / English and vernacular languages.

Will Rodent eradication disturb the ecological balance?

Ishwar Prakash

CAZRI, Jodhpur-342 003

Total eradication of a small mammal like field rodents is *impossible*. Any efficient method would reduce rodent population to the maximum of 95 percent in a large area. If taken up by the farmers, in a control operation, the rodent population is reduced only by 80 to 85 per cent of the initial level. Even

a 5 per cent of the residual population of field rodents is considered sufficient to maintain the ecological balance. Because of high rate of reproduction and larger litter size, the rodents are capable of building up their population levels in short time.

In any ecosystem rodents play a substantial role of destroying the vegetation, loosening the soil and of damaging other commodities. The magnitude of this role is so high that it does not compare to the advantageous role they sometimes play by eating certain insect pests of crops.

Then why the processes of the organic evolution maintain such a high population of rodents in a biome? Because most of the herbivorous and seedivorous rodents constitute a major food centre in the food web in an ecosystem. However, if 5 to 10 per cent of the rodent population survives a control operation this ecological function of the rodents will be fulfilled. Assuming that with a miracle we can remove the total population of rodents in an ecosystem, the food chain is expected to be disturbed; as a consequence of which the population of snakes, eagles, other predatory

birds and of some carnivorous mammals is likely to be affected. However, predatory animals have a varied dietary and not a single predator is known to survive exclusively on rodent food. They consume birds, their eggs, lizards, insects and other small mammals. If one of their foods (rodents) is removed from the ecosystem they are known to switch over to other diets without a noticeable effect on their numbers.

Since it is not possible to eradicate rodents from an ecosystem, the word 'control' is not even used in modern science. It is the pest management, the aim of which is to maintain pest population to the minimum level so that they do not cross the economic threshold level. After all what we call an ecological balance, it is purely a 'selfish' need-oriented programme of *Homo sapiens*, without any consideration for the survival of any other biota!

odent Control Week in Tamilnadu

G. P. Ranganathan

Save Grain Campaign, Madras-600 006

The Save Grain Campaign Regional Office stationed at Madras observed a "National Control Week" during March 1981, immediately after harvesting in different districts of Tamilnadu and Pondicherry.

Following data are recorded:

A Rodent control in residential premises	
No. of houses covered	1345
No. of bait stations placed	8636
Quantity of bait material used	865 kg; Cost Rs. 1710/-
Quantity of Chemical used	50 kg; Cost Rs. 1000/-
Cost of chemical & bait material	Rs. 2710/-

No. of dead rats	11,214	Cost of bait material	Rs. 1100/-
Quantity of grain saved	448 Q	Cost of chemical with bait material	Rs. 3305/-
Value of foodgrains saved	Rs. 67,200/-	Quantity of foodgrain saved	9273 Q
B Rodent control in field		Value of foodgrain	Rs. 13,90,950/-
Area covered	2781 acres	Value of foodgrains saved through house rodent control	Rs. 67,200/-
No. of burrows fumigated	18,545 Nos.	Value of foodgrains saved through field rodent control	Rs. 13,90,950/-
Quantity of Aluminium phosphide utilised	16.404 kg.	<hr/>	
Cost of chemical	Rs. 1809/-	Grand Total	Rs. 14,58,150/-
Quantity of Zinc phosphide utilized	11.00 kg.	The rodent species killed were :	
Cost of chemical	Rs. 396/-	<i>Bandicota bengalensis</i> , <i>B. indica</i> , <i>Tatera indica</i> , <i>Rattus rattus</i> , <i>Mus musculus</i> and <i>M. booduga</i> . ■	
Total bait material	550 kgs.		

Notes and News

Dr. Ishwar Prakash, Coordinator, National Programme for Rodent Pest Management, CAZRI, Jodhpur has been elected as a Fellow of the Indian National Science Academy.

Shri K. K. Arora, Technical officer Save Grain Campaign, Regional office, Bangalore has been awarded Ph.D. degree in Zoology by Meerut University on his thesis entitled "Histochemical studies on rat control with anticoagulants and chemosterilants."

National Seminar

The Indian Council of Agricultural Research, in collaboration with the Rodentological Society of India, is organizing a National Seminar on Rodent Research and Control at Central Arid Zone Research Institute, Jodhpur from 24-26 February, 1982. There will be five sessions.

- (1) Systematics and Ecology of Rodents
- (2) Ecology of Rodents
- (3) Biology and Physiology of rodents and Damage Assessment
- (4) Health aspects, Training and Education
- (5) Rodent Pest Management.

The next issue will appear in Feb. 1982 Contributions for inclusion in the Newsletter may please be forwarded to :

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