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Rodent pests and their control in poultry farms of Jodhpur

DEVENDRA BHARDWAJ
Coordinating & Monitoring Centre for Rodent Research and Training,
Central Arid Zone Research Institute, Jodhpur-342 003

ABSTRACT

Nine poultry farms around Jodhpur city were surveyed. Indian gerbil, *Tatera indica* was found to be the predominant species in the poultry farms situated away from human habitation followed by black rat, *Rattus rattus*. However, *Rattus rattus* was the predominant species of the poultry farms close to human habitation followed by *Mus musculus*. Poultry feed is recommended as the carrier of poison whenever rodent control operations are taken up in poultry farms.

INTRODUCTION

With a view to assess the magnitude of rodent infestation in poultry farms, the damages inflicted by them to the poultry feed, birds and eggs and to understand the attitude of poultry farmers towards rodent control, a survey was conducted in 9 poultry farms around Jodhpur city. Poultry farms were classed into two categories (1) situated in the city (800 to 1500 birds each) close to human habitation, (2) situated outside the city (1000 to 5000 birds each) away from human habitation.

Very little work is being conducted in India on rodent species composition, their population cycle and the damages inflicted by them in the poultry farms. *R. rattus* was found to be predominant species in poultry farms around Tirupati city, followed by *Bandicota bengalensis*, *Bandicota indica*, *Mus musculus* and *Rattus meltada* (Puroshotham, 1983). Around Ludhiana also, *R. rattus* was reported to be the abundant rodent followed by *Mus musculus*.

METHODS

To work out the species composition of rodents in the poultry farms around Jodhpur city, sherman and wonder traps were placed for 72 hrs in bird sheds, poultry feed godowns and egg stores.

Trapped rodents were weighed, sexed and kept individually in laboratory cages. A study was conducted on the

feeding behaviour of Indian gerbil, *Tatera indica indica* and its response towards acute and chronic poisons. This choice was tested between 3 foods : (1) a commercial poultry feed (composition : cracked maize 35%, polished rice powder 35%, groundnut cake 17%, fish meal 5%, calcium oggomin 2%, calcium powder 2%, small pieces of stones 1%, (2) pearl millet (*Pennisetum typhoides*), and (3) *jowar* (*Sorghum vulgare*). Three poisons (Zinc phosphide 1.0%, Brodifacoum 0.005%, Racumin 0.025%) were tested by mixing them in the above 3 foods immediately after trapping the gerbil and after acclimatizing them on millet and *jowar* for a month in laboratory.

RESULTS AND DISCUSSION

Rodent species composition

The trapping results indicated that the poultry farms away from human habitat were infested predominantly by *T. indica* followed by *Rattus rattus* while in poultry farms close to human habitat, *Rattus rattus* was the predominant rodent followed by *Mus musculus* (Table 1). It has been earlier reported (Prakash, 1974) that *T. indica* stays close to the human habitat but it is being reported from the poultry sheds for the first time in the desert. Presence of *T. indica* in the poultry farms is rather hazardous because it is fairly resistant to plague bacillus and is, in fact, its reservoir (Baltazard and Bahmanyar, 1960). *T. indica* functions as a liaison rodent in respect of transmitting the plague bacillus to *Rattus rattus* through ecto-parasites. Therefore, the association of *T. indica* and *R. rattus* is considered to be a serious health hazard.

Table 1. Average number of rodents trapped per night from poultry farms

	Number of species trapped		
	Tatera indica	*Rattus rattus*	*Mus musculus*
Poultry farms away from human habitat	34	2	Nil
Poultry farms close to human habitat	Nil	23	3

Food preference

Twenty *T. indica*, which were conditioned on feeding poultry feed, being residents of poultry farms, were provided two feeds simultaneously in separate containers (Table 2). It was revealed that 16 gerbils continued to prefer poultry feed significantly ($P < 0.001$) in choice tests when the alternate food was either *bajra* whole grains or *jowar*. However, only 4 *T. indica* (2 o, 2 o) started preferring millet and jowar after 15 days of feeding trial. The consumption of the two latter feeds increased significantly ($P < 0.05$, Table 2).

Poisioning trials

When the three poisons were separately exposed to *T. indica* mixed with poultry feed, control success was 100 per cent (Table 3) but when the poisons

Table 2. Mean food intake (g/100 g body wt. upto 30 days by *Tatera indica* captured from poultry farms

Days	No change in food preference (N—16)				Change in food perference (N—4)			
	Poultry feed	Vs Millet	Poultry feed	Vs *Jowar*	Poultry feed	Vs Millet	Poultry feed	Vs *Jowar*
1-8	8.24 ±0.89	2.31 ±0.073	8.73 ±0.61	1.89 ±0.059	8.91 ±1.06	2.23 ±0.612	8.24 ±1.71	1.94 ±0.537
9-15	8.56 ±0.97	2.43 ±0.124	8.38 ±0.73	1.96 ±0.078	5.03 ±1.61	5.48 ±1.093	4.73 ±0.98	5.21 ±0.992
16-22	8.46 ±1.02	2.12 ±0.057	8.44 ±0.49	2.03 ±0.084	3.42 ±0.95	7.79 ±1.263	2.81 ±0.53	7.13 ±1.061
23-30	8.71 ±0.74	2.39 ±0.093	8.52 ±0.59	1.79 ±0.064	3.38 ±0.89	7.84 ±1.434	2.87 ±0.48	7.17 ±1.143

were mixed in millet or in *jowar* the mortality did not exceed 50%. However, when the gerbils were acclimatised to feeding on millet and *jowar* for 30 days, the control success increased to 100% in case of zinc phosphide but remained at 87.5% only with the two anticoagulants (Table 3).

Table 3. Mortality after poison exposure immediately after trapping and after acclimatizing them for a month in laboratory

Poison	Immediate poisoning			Poison after acclimatizing on	
	Mortality after poisoning in poultry feed	Mortality after poisoning in millet	Mortality after poisoning in *jowar*	Mortality after poisoning in millet	Mortality after poisoning in *jowar*
Zinc phosphide, 100%	6/6	3/6	2/6	6/6	6/6
Brodifacoum, 0.005%	8/8	3/8	2/8	8/8	7/8
Racumin 0.025%,	8/8	3/8	2/8	7/8	7/8

Efforts to control the rodent pests, are faced with many hurdles, some of which are unique. The most glaring concerns the selection of 'baits' or foods to serve as vehicles for poison meant to kill them and in natural conditions, tasting whatever food is encountered presumably helps an animal to make the best of what is available (Barnett, 1975). Our findings indicate that in the presence of poultry feed, even if other bait materials were provided, there was hardly any intake of the latter even after 3 days of exposure which is the usual period of prebaiting before starting any poison campaign. Our results also suggest that even 9 to 15 days of prebaiting would not give satisfactory results as only 20% of the gerbils changed their preference from poultry feed to millet or *jowar* (Table 2). Hence, if any bait other than poultry feed is used as the carrier of poisons in a poultry farms, it is likely to have only a marginal effect on the resident rodent population there. It may, therefore, be concluded that a viable strategy for rodent control in poultry farms should include poultry feed as the bait of choice.

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