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MIGRATION OF FIELD RODENTS DUE TO POISON-BAITING

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ABSTRACT

The present information comprises the results achieved as a result of the error in control success due to migration of rodent on the deployment of a rodenticide. Murids are found to be highly mobile in the fields and their range of migration fell between 40.0 m and 76.3 m. Single exposure of Bromadiolone/Brodifacoum has kept the anticoagulants at an edge over in rodent control levels. Migration in rodents has been found occurring as a consequence of the communication brought about by the victimised animals.

INTRODUCTION

Failure in field rodent management has led to explore various possibilities, of which the most vulnerable is their migratory behaviour. Hence for better management, better knowledge about migration in different rodent species in a given ecological niche is a must. Some information in this regard has already been published by the authors (Pasahan and Sabhlok 1987) which is based upon the graded removal of wild vegetation in the region of inhabitation of field murids. Present information, however, comprises the results achieved as a consequence of the error in control success evaluation due to migration of animals which are taken to be dead on the deployment of lethal dose of rodenticides.

MATERIAL AND METHODS

Studies on migration behaviour of three predominant rodent species - *Tatera indica*, *Meriones hurrianae* and *Mus booduga* constituting a mixed population, were carried out in the fields of Gangwa village of Hisar (Haryana). The population was subjected to the lethal dose of different rodenticides. Initially animals in one hectare area with relatively higher density of burrows, were marked following CMR method. Proceeding the rodenticidal treatment the dead animals were collected from all round the pristine burrows. Trappings were then conducted in the periphary of about 80 m of the original habitat to account for the marked rodents which gave the number of the animals migrated.

a) **Acute rodenticide treatment** : 2% Zinc phosphide/1% Silmurin mixed with broken bajra were used to the tune of 10 g/living burrow for an overnight and the dead animals were flushed out the next morning.

b) **Anti-coagulant treatment :** Single exposure of O. 25% conc. loose formulation of Bromadiolone/Brodifacoum mixed with adjuvant (Groundnut oil) and broken bajra in a proportion of 1: 1: 48; or of 0.005% conc. wax blocks of Bromadiolone/ Brodifacoum was administered to the tune of 10g/live burrow. The dead animals were mustered continuously for a period of 10 days.

c) **Fumigant treatment :** Aluminium phosphide was deployed at the rate of 1.5g/ living burrow. The number of surface openings reopened was counted and an all out effort was made to take out dead animals by excavating the treated burrows.

Further investigations were extended by the induction of sublethal dose of rodenticide to understand as to whether migration tendency in field rodent was a consequence of the lethal dose of the rodenticide deployed or of the visual effect of the animals killed.

For that marked population at two widely apart fields 'A' and 'B' was subjected to sublethal dose of zinc phosphide (0.02%). Simultaneously in field 'B' dead rodents comprising the same species were spread to the tune of 30% of the living burrows. That was to provide visuality of the killed animals. In either case trappings were conducted in the periphary of about 80 m of the orginal habitat and the number of marked animals caught was accounted.

RESULTS AND DISCUSSION

Estimation of the rodent mortality as a consequence of rodenticidal effect has been ascertained by the number of dead animals flushed out from the treated burrows. Follow up catches of the marked animals in the periphary of the original habitat facilitated computing the number of animals migrated. However, unaccounted rodents included the number which were either killed or migrated but have certainly escaped from been traced or caught. The accountability of such animals, therefore, highly necessitate the use of more sophisticated techniques including telemetry and radioactive tracers (Frantz 1972; Fulk *et al.* 1981).

On the three murid species constituting the mixed population under investigation, the extent of their mortality, migration and untraceability under different rodenticidal treatments has been depicted populationwise in Table 1 and specieswise in Fig. 1.

The data collected have revealed murids to be highly mobile in the fields and their range of migration fell between 43.0 m and 76.3 m. It is, therefore, highly suggestive that even when the control success of an operation is assessed, migration of rodents shall always be considered. Further, none of the rodenticides presently deployed has resulted in cent percent rodent mortality under semi controlled conditions unlike what has invariably been reported by various workers under laboratory

Table 1. Effect of rodenticides on migration of field rodents.

Sr. No.	Rodenticide	Actual no. of animals	Animals killed	Animals migrated (per cent)	Unaccounted animals	Range of migration (m)
a)	Zinc phosphide	56.0	24.1	34.8	41.1	40.0-62.0
	Silmurin	52.3	27.8	45.6	26.6	44.3-59.3
b)	Bromadiolone (loose forn ulation)	71.3	68.3	21.8	09.9	56.7-76.3
	Bromadiolone (wax cake) formulation	51.3	63.4	22.8	13.8	57.0-70.4
	Brodifacoum (loose formulation)	73.3	60.1	15.9	21.0	51.0-67.7
	Brodifacoum (wax cake formulation)	90.0	66.6	05.6	27.8	56.0-65.0
c)	Aluminium phosphide	65.6	47.9	21.5	30.6	45.0-75.0

conditions (Jain and Das 1980; Rai et al. 1982). However, when the present evaluations are compared among themselves, they obviously keep the anticoagulants at an edge over in so far as control levels under field conditions are concerned. Both types of formulations (i. e. loose as well as wax blocks) of the anticoagulant rodenticides have been found almost equally effective. However, wax blocks were easy to handle. In West Indies, Marsh et al. (1980) have reported 87% control with a single dose application of Bromadiolone.

Application of sublethal does of zinc phosphide has revealed absolutely no effect on the marked population in either of the two fields 'A' and 'B'. Trappings conducted in the periphery showed no catch of the marked animals. Hence migration tendency among rodents under the influence of lethal dose of the rodenticide could be inferred occurring as a consequence of the communication brought about by the victimised animals who had actually consume the poison bait and were in distress. Barnett et al. (1975) have also advocated the ability in rodents to avoid a food as a result of experiencing ill effects after eating it.

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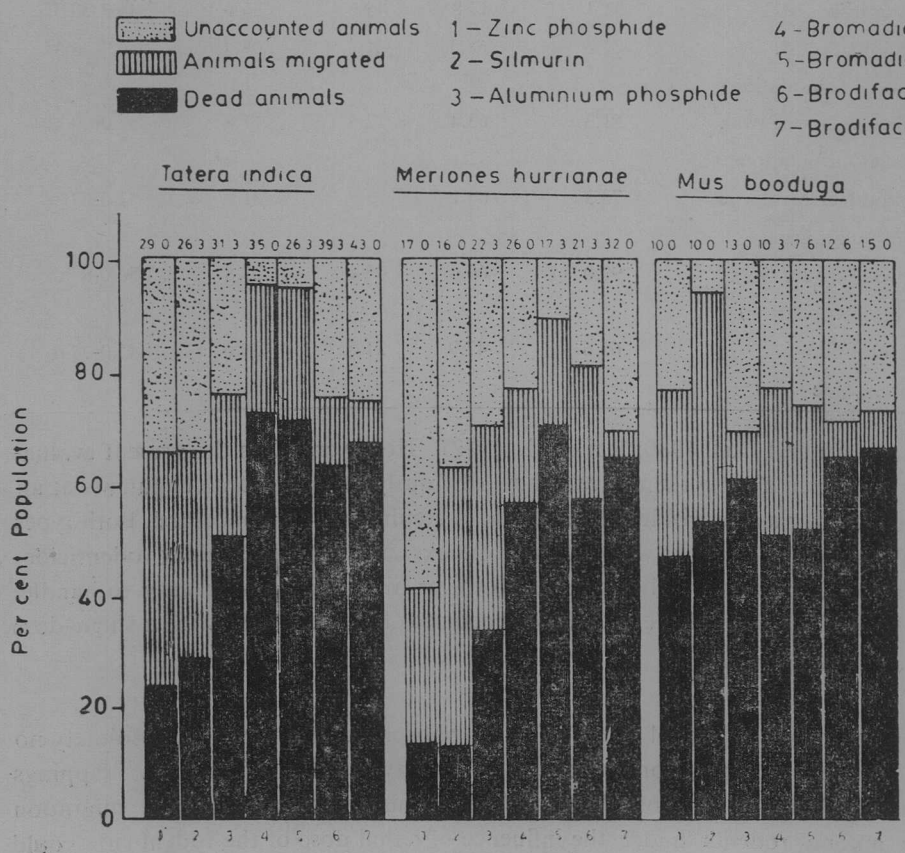

FIG 1 POPULATION OF MURIDS UNDER DIFFERENT RODENTICIDAL TREATMENTS (FIGS ON THE TOP OF THE BARS REPRESENT ACTUAL NUMBER OF MURIDS)

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