SEASONAL VARIATION IN THE POPULATION OF HOUSE MOUSE *(MUS MUSCULUS)* IN CANAL IRRIGATED WHEAT-SUGARCANE FODDER CROPLANDS

Hammad Ahmad Khan
Department of Zoology and Fisheries,
University of Agriculture, Faisalabad

A total of 6300 trappings in the wheat-sugarcane-fodder canal irrigated farmland, resulted the trap success of 4.9% in cotton, 6.5% in fodders, 5.0% in the sugarcane, 4.8% in vegetable crops and 3.1% in the wheat.

INTRODUCTION

The house mouse *(Mus musculus)* is a significant murid pest of the agricultural crops in Pakistan and is more abundant in the Punjab. In addition, it also infests human dwellings along with the foodstuffs.

Rodenticides and pesticides, although prove to be the effective weapons for the control of these rodent pests, their unwise and non-selective use is always a threat to the non-target species and may disrupt the agro-ecosystems. The main objective of the present study was, therefore, to infer the abundance and the seasonal variations of house mouse in different agricultural crops.

MATERIALS AND METHODS

Studies on the seasonal variations and distribution of house mouse were extended from August 1988 through June 1989 in a canal irrigated farmland near village 61 J.B., about 15 kilometers away from the Faisalabad. Crops and ecosystem, in which the study was performed, consisted of cotton, fodders (leguminoid and graminoid), sugarcane, vegetables and wheat.

Study area was divided into four blocks (1, 2, 3 and 4). Each block consisted of 25 acres of the cropland. Every month, eight acres were chosen for the sampling of house mouse *(Mus musculus)* by random sampling. From October onwards, two more blocks, 5 and 6 were added to the earlier four blocks. Each selected acre was served with 15 snap-traps (10-rat and 5-mouse traps) for five successive nights. The traps were placed in the manner that three were at the four corners and the remaining three in the centre of the fields. The traps were set late in the evening with the local bread (Roti), being used as the bait and were picked up early next morning. The trapped specimens of house mouse after being given the field numbers were brought to the laboratory, to calculate the trap success of *Mus musculus* in different cropped areas.

RESULTS AND DISCUSSION

Cotton: Cotton crop was sampled for six months (August to December and again in June), during which 12.5 acres were trapped for *Mus musculus,* with 935 trapnights yielding an average trap success of 4.9% (Table 1).

Fodders: Fodders, leguminoid (sorghum, maize and millet) and graminoid (berseem, lucern and shaftal) were sampled for the entire study period. In all, 25 acres were sampled for the house mouse, covering 1875

Table 1. Seasonal variations of *Mus musculus* in canal irrigated croplands

Months		August	September	October	November	December	January	February	March	April	May	June	Total
Cotton	Acres trapped	2	2	2	2	3	-	-	-	-	-	1.5	12.5
	Trapnights	150	150	150	150	225	-	-	-	-	-	110	935
	Trapsuccess (%)	6.6	4.6	11.3	2	3.1	-	-	-	-	-	1.8	4.9
Fodders	Acres trapped	3	3	2	3	3	1	2	2	1	3	2	25
	Trapednights	225	225	150	225	225	75	150	150	75	225	150	1875
	Trapsuccess (%)	11.5	6.2	15.3	12.8	6.6	0	0	0	4	3.1	3.3	6.5
Sugarcane	Acres trapped	2	2	2	2	2	3	1	1	-	1	2.5	18.5
	Trapnights	150	150	150	150	150	225	75	75	-	75	190	1390
	Trapsuccess (%)	8.4	4	13.6	0	3.1	0	1.3	8	-	8	5.2	5.0
Vegetables	Acres trapped	1	1	1	1	-	1	1	-	2	2	-	10
	Trapnights	75	75	75	75	-	75	75	-	140	150	-	750
	Trapsuccess (%)	2.6	4	16	14.6	-	2.6	0	-	0.3	2	-	4.8
Wheat	Acres traped	-	-	-	-	-	3	3	5	5	2	-	18
	Trapnights	-	-	-	-	-	-	-	375	375	150	-	1350
	Trapsuccess (%)	-	-	-	-	-	2.2	2.2	3.2	1.3	4	-	3.1

trapnights and the average trap success was 6.5% (Table 1).

Sugarcane: Sugarcane was trapped for all the months (except in April). A total of 18.5 acres were sampled, with 1390 trapnights and the average trap success was 5.0% (Table 1).

Vegetables: Vegetable crops were sampled for eight months (August through October, in December and again during April and May). In all, 10 acres were trapped, with 750 trapnights spent with the average trap success of 4.8% (Table 1).

Wheat: Wheat was trapped for five months (January through May). A total of 18 acres were sampled, employing 1350 trapnights and an average trap success of 3.1% was achieved.

In this area, the house mouse was the most abundant species, compared to other murid pests. It was of interest to point out that the mouse exhibited a fairly similar trap success in all the cropped areas, 4.9% in the cotton, 6.5% in fodders, 5% in sugarcane, 4.8% in vegetables and 3.1 in the wheat (Table 1).

In view of this fair resemblance in the values of the trap success, it was not possible to single out a certain preferred crop by the house mouse. This can be attributed to the wide ecological niche of the mouse.

Mus musculus was abundant during the "Fall season", in fodders, sugarcane and the vegetables crops. The other murids, like the Bandicoot rat *(Bandicoota bengalensis),* (Siddique, 1989) and the Metad *(Millardia meltada),* (Mukhtar, 1989), also achieved their abundance in "Fall" in the fodders and the sugarcane crops. It implies that these are the most favoured crops for the rodent pests. House mouse valued 3.1% in the wheat (slightly more than other species) and it was considered due to the fact that breeding cycle of *Mus musculus,* was spread over the entire year (Rana and Beg, 1979; Khan, 1982).

In the vegetables, the house mouse showed a trapsuccess of 4.8%. However, Bandicoot rat (Siddique, 1989), the Metad (Mukhtar, 1989) and the Indian gerbille *(Tatera indica)* (Rehman, 1989) occurred rarely in the vegetable crops. Fodders were the most favourable crops for *Mus musculus,* since it attained a maximum trap success of 6.5%. The infestation was also fair in the sugarcane crop (5.0%) which was due to the fact that the mouse digs out holes at various places in the "cane fields". In addition, the house mouse in the sugarcane crop also gets good vegetational cover. However, the gebrilles *(Tatera indica)* and the Metads *(Millardia meltada)* were less frequent in the sugarcane crop.

An important aspect of *Mus musculus* is its habit of capturing various insects to supplement the diet (Fulk *et al.,* 1981). A clear dominance shown by the house mouse over the companion murid pests is therefore, ordeal to be controlled. *Mus musculus,* apart from damaging the agricultural crops, also spoils the stored food grains (Spencer, 1953).

The data on seasonal variations suggested that the rodenticides and the pesticides must always be employed in appropriate amounts by the farmers to retard the populations of the house mouse in "fall" (when the infestation of mice is likely to be at the optimum) and again in the late "spring" (April and May), particularly in the leguminoid fodder crops.

REFERENCES

Fulk, G.W., S.B. Lathiya and A.R. Khokhar. 1981. Rice field rats of lower Sindh: abudance, reproduction and diet. J. Zool Lond. 193: 371-390.

Khan, A.A. 1982. Biology and ecology of some rodent pests of agriculture in Punjab. Ph.D. Thesis, Deptt. Zoology & Fisheries, Univ. of Agri., Faisalabad.

Mukhtar, M.K. 1989.Movement patterns and seasonal changes in abudance of *Millardia meltada* in canal irrigated farmlands of central Punjab. M.Sc. Thesis, Deptt. Zoology & Fisheries, Univ. of Agri., Faisalabad.

Rana, S.A. and M.A. Beg. 1979. Field biology of *Mus musculus* and *Mus booduga* in Punjab. Pak. J. Zool. 8: 135-141.

Rehman, S. 1989. Movement patterns and seasonal changes in abundance of *Suncus murinus* and *Tatera indica* in canal irrigated farmlands of central Punjab. M.Sc. Thesis, Deptt. Zoology & Fisheries, Univ. of Agri., Faisalabad.

Siddique, M. 1989. Seasonal changes in abundance of *Bandicoota bengalensis* in an irrigated cropland. M.Sc. Thesis, Deptt. Zoology & Fisheries, Univ. of Agri., Faisalabad.

Spencer, M.M. 1953. The behaviour of rats and mice feeding on the whole grains. J. Hyg. Camb. 51: 35-80.