

BAIT-SHYNESS AND POISON-AVERSION: A STUDY IN *MUS MUSCULUS* ALBINO

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Bait-shyness and poison-aversion develops after consumption of a sublethal dose of zinc phosphide. The intensity of aversion depends on the period of exposure of poison bait (15 days and 25 days with 1 day and 4-days exposure to zinc phosphide respectively). Induction of bait-shyness requires association of the zinc phosphide with the bait material. When fed orally by stomach tube or if the carrier bait is changed, produces no change in the daily consumption of food.

INTRODUCTION

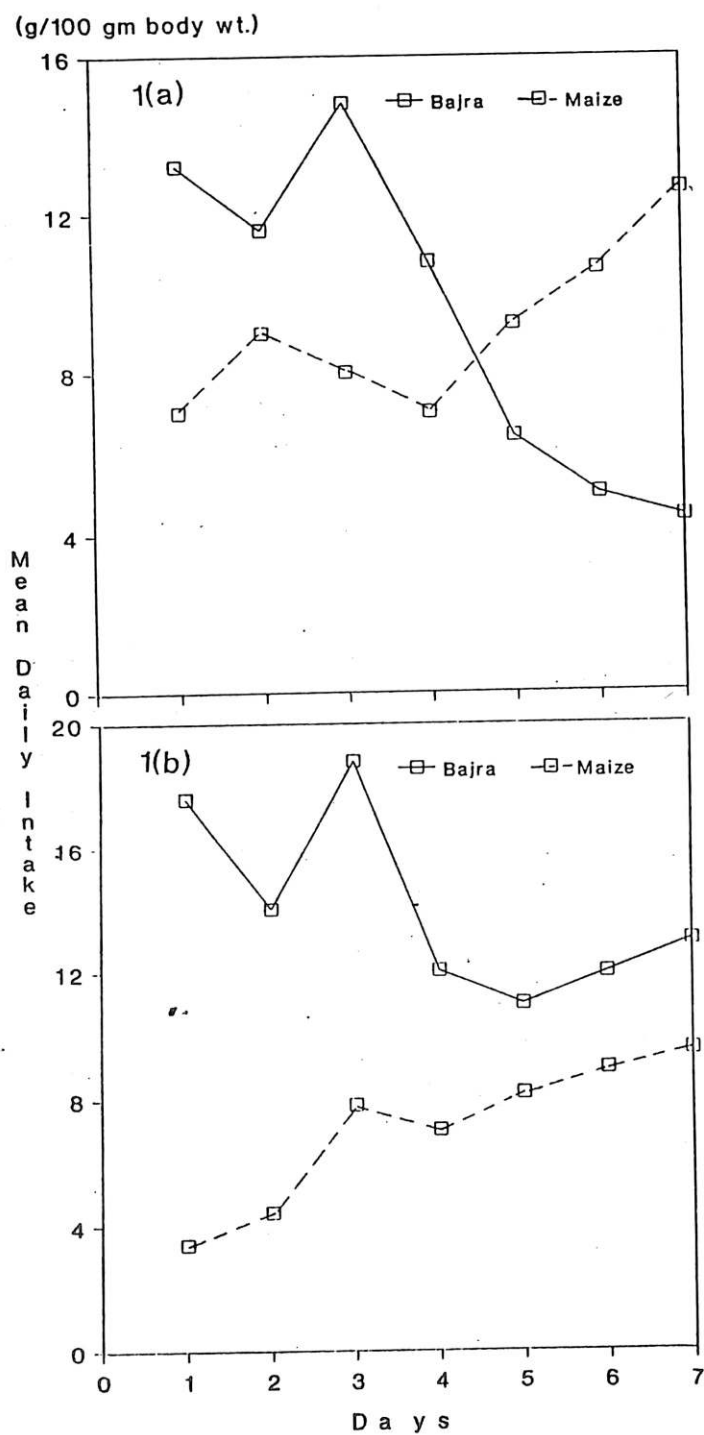
The damage caused by the rodents is imprecise and conservative. For the management of these pests, number of control measures are employed. Use of rodenticides are considered to be the most effective means of control. In India, acute rodenticides like zinc phosphide is available indigenously. The major drawback in their use is that number of rodent species while feeding upon these poison baits take only a sublethal dose of the poison and recover after withstanding a period of sickness. They are evidently able to associate the sickness with the bait as well as with the poison (Rzoska, 1954) and obviously avoid the food material in which the toxic chemical was mixed (bait-shyness) and the poison (poison-shyness). In communication with the behavioural aspects of poison-aversion and bait-shyness among Indian rodents (Barnett *et al.*, 1975; Prakash & Ojha, 1978; Bhardwaj & Khan, 1978), the present study reveals the results on *Mus musculus* albino.

MATERIAL AND METHODS

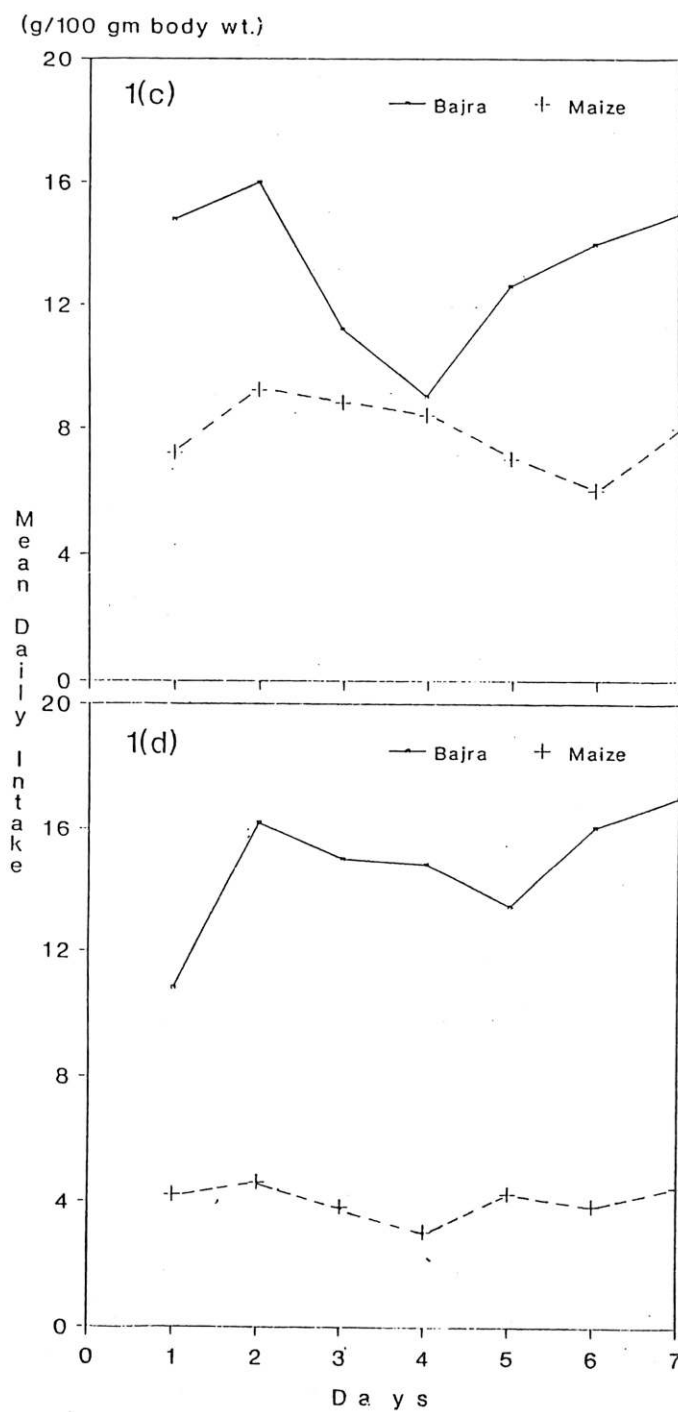
Shyness behaviour in *Mus musculus* albino towards zinc phosphide is studied in the present investigation and its different aspects are touched upon, under four separate tests. In each of the trials, 8 adult animals of almost equal body weight were lodged individually in laboratory cages and maintained with weighed quantities of Bajra and Maize. Tap water was provided *ad libitum* and mean daily intake of each food was measured. In Test I, sublethal dose of zinc phosphide (0.025%) mixed in bajra with 2% groundnut oil and 2% sugar was offered for 4 subsequent days. While in Test II, poison bait was exposed only for 1-day (on 4th day). Persistence of bait-shyness was tested by offering bajra mixed with 2% groundnut oil and 2% sugar for 24 hrs at interval of 7, 15, 25, 33 days after the exposure to poison. In Test III, sub-lethal dose of zinc phosphide (0.025%) was administered with the help of stomach tube and in Test IV, 0.025% zinc phosphide mixed with wheat flour, 2% groundnut and 2% sugar was exposed for 24 hrs only (on 4th day). Consumption of bajra and maize was recorded prior to and after exposure of poison bait in both test respectively. Thereafter the mice were maintained with normal rat feed.

RESULTS AND DISCUSSION

The observations are shown with the help of graphs plotted between mean daily intake of bajra and maize vs days. In all the 4 tests bajra was found to be the preferred food and was consumed more ($P < 0.01$) than maize before sublethal dose of zinc phosphide was added to it. With the continued exposure of poisoned bait for 4 days, the intake of bajra declined sharply and as a consequence of which the intake of maize increased ($P < 0.02$) (Fig. 1a). However, in Test II (Fig. 1b) when poisoned bait was offered only for a single day, the intake of bajra declined immediately and that of maize increased ($P < 0.02$). But on subsequent days the intake of bajra recovered as compared to that after 4 days poisoning. Bait aversion persisted for almost 25 days and 15 days with 4-day and 1 day exposure to zinc phosphide respectively. To show that the memory of sickness is associated with the bait, with the administration of sublethal dose of zinc phosphide by stomach-tube, the preference of



Figs. 1 (a) & (b). (a) 4-Days exposure to 0.025% zinc phosphide (on 4th, 5th, 6th & 7th day); (b). 1-Day exposure to 0.025% zinc phosphide (on 4th day).



Figs. 1 (c) & (d). (c) Oral feeding of 0.025% zinc phosphide (on 4th day); (d). Change of carrier bait (wheat) + 0.025% zinc phosphide (on 4th day).

food was not changed (Fig. 1c). Similarly the intake of bajra before and after poisoning with zinc phosphide remained almost same even when poison was mixed with and different carrier bait (Fig. 1d). The results indicate that aversion and shyness develops only when the poison is mixed with the food. Poison aversion towards zinc phosphide is also studied in hairy-footed gerbil, *Gerbillus gleadowi* (Rana *et al.*, 1975), Indian gerbil, *Tatera indica* and desert gerbil, *M. hurrianae* (Prakash & Jain, 1971), *Mus musculus bactrianus* Blyth (Rao & Prakash, 1980), *Rattus rattus* (Singh & Saxena, 1991). The acquired shyness persisted for a considerable period in *G. gleadowi* only for 15 days; *T. indica* 115, *M. hurrianae* 35 days (Prakash I, 1993).

Table 1. Persistence of Bait shyness in *Mus musculus* albino after exposure to zinc phosphide (0.025%).

Exposure period	Food offered	Mean daily intake before poison exposure (g/100g b.wt.)	Mean daily intake (g/100 g body wt.) after exposure to sublethal dose of zinc phosphide (0.025%) on (days)			
			7th	15th	25th	33rd
1-day exposure	Bajra	16.90 ± 1.47	13.03 ± 0.69	16.2 ± 0.04	17.0 ± 0.04	—
	Maize	5.43 ± 1.22	9.65 ± 0.10	6.0 ± 0.06	5.2 ± 0.05	—
4-days exposure	Bajra	13.29 ± 0.89	4.47 ± 0.02	10.1 ± 0.05	13.0 ± 0.08	13.2 ± 0.08
	Maize	8.0 ± 0.049	12.5 ± 0.97	6.0 ± 0.06	7.8 ± 0.13	8.1 ± 0.06

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