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EFFICACY OF BRODIFACOUM (TALON) BAIT AGAINST THREE RODENT SPECIES

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ABSTRACT: Brodifacoum was fed to three rodent species, viz., *M. hurrianae*, *R. rattus* and *F. pennanti*, using a no-choice feeding trial for 7 days at various concentrations--0.005%, 0.0025% and 0.00125%. The compound was found effective, palatable, developed no sign of poison bait-shyness but indicated a slight aversion of poison. The death of the animals was due to pulmonary distress and hemorrhage.

INTRODUCTION

After about 8 years' use in Britain, resistance to the anticoagulant, warfarin, was discovered in Scotland (Boyle 1960) and has also been reported in a number of countries (Dubock and Kaukeinen 1978). The discovery of resistance led directly to the development of a new anticoagulant, brodifacoum [3 - (-3 (4' - bromo-biphenyl)-4 yl) -1, 2,3, 4-tetra-hydro-1-naphthalenyl) - 4 - hydroxy-2H-1-benzopyron-2-one], which was shown to be very effective against the commensals (warfarin-resistant and nonresistant) and also tropical and subtropical rodent pests of agriculture (Redfern et al. 1976, Mathur and Prakash 1980a, b, Saxena and Sharma 1981, 1982). The present study deals with the evaluation of brodifacoum against two field and one commensal rodent pest inhabiting the Indian desert.

MATERIAL AND METHODS

The animals

The field rodents used were the Northern palm squirrel (*Funambulus pennanti* Wroughton) and Indian desert gerbil (*Meriones hurrianae* Jerdon). All were captured in the field around Jaipur. House rats (*Rattus rattus rufescens* Gray) were captured from houses and godowns. They were caged individually and were provided with wheat flour + 1% vegetable oil + 1% molasses for 15 days to acclimatise to laboratory conditions. Water was available ad libitum. Both sexes (5+5) were used for the test.

No-choice feeding test

The poisoned bait (standardised bait from ICI, U.K.) of brodifacoum at different concentrations (.005%; .0025% and .00125%) was used. It was provided continuously for 7 days along with a group of controls (i.e., provided wheat flour + 1% vegetable oil + 1% molasses) of all three species. Consumption was noted every day and was replaced by fresh poison bait. After exposure the animals were maintained on normal diet of wheat flour + 1% vegetable oil + 1% molasses for some days during which mortality was recorded. Dead animals were dissected to confirm the cause of death.

RESULTS AND DISCUSSION

On the basis of poison bait consumed in 7 days (Table 1), the consumption of poison bait was in general highest on the first day, reaching levels that could rarely be achieved during the subsequent days of feeding. Mostly, 5th, 6th or 7th day of intake was observed very low at all the concentrations used (i.e., .005%; .0025% and .00125%), indicating the aversion of poison with all three species.

The data also reveal that all three species consumed mostly the same amount of plain bait per 100 gm body weight as compared to poisoned bait in the period of 7 days' feeding. This indicates that the compound is sufficiently palatable and develops no sign of poison bait-shyness.

It appears that there is no relation in bait intake and time to death, since *M. hurrianae* and *R. rattus* succumbed very early with low bait intake whereas *F. pennanti* with high intake took more time to death.

At all the concentrations used, the efficacy of brodifacoum indicates 100 percent mortality in all *M. hurrianae*, *R. rattus* and *F. pennanti* within the 7 days of feeding. These findings are in accordance with the findings of Mathur and Prakash (1980a, b) and Soni (1981), who worked on *F. pennanti*, *M. hurrianae* and *R. rattus*.

Poisoning symptoms such as pulmonary distress, sluggishness and hemorrhage (bleeding from mouth, nose and anal region) were noticed after 2 days of feeding. Therefore, the present study indicates that brodifacoum could be used for the effective control of wild and commensal rodents which developed bait-shyness after the treatment of acute poisons.

Table 1. Efficacy of brodifacoum (Talon) bait against three rodent species.

| Species | Mean body weight (gm) | Conc. of brodifacoum in bait (%) | Poison bait consumed in 7 days (gm/100 gm b.wt) Mean + S.E. | Brodifacoum ingested (mg/kg) mean + S.E. | Average day to death |
|----------------------------|-----------------------|----------------------------------|---|--|----------------------|
| <u>Meriones hurrianae</u> | 96.42 | .005 | 38.42±4.25 | 19.21±2.12 (16.00-13.00) | 4.2 (3-6) |
| | 94.28 | .0025 | 36.28±5.04 | 9.07±1.26 (8.00-11.00) | 6.4 (5-8) |
| | 98.52 | .00125 | 34.32±4.50 | 4.29±0.56 (4.00-6.00) | 7.8 (4-10) |
| | 90.30 | Plain bait | 38.68±4.38 | - | - |
| <u>Rattus rattus</u> | 116.42 | .005 | 42.22±2.35 | 21.11±1.18 (18.00-29.00) | 4.5 (3-6) |
| | 110.22 | .0025 | 44.28±3.47 | 11.11±0.86 (10.00-14.00) | 7.4 (6-10) |
| | 112.64 | .00125 | 40.62±3.78 | 5.08±0.46 (4.00-7.00) | 10.5 (8-13) |
| | 116.52 | Plain bait | 44.58±2.51 | - | - |
| <u>Funambulus pennanti</u> | 198.46 | .005 | 46.62±3.37 | 21.33±1.68 (17.00-27.00) | 5.5 (4-8) |
| | 186.54 | .0025 | 48.78±2.68 | 12.20±0.67 (11.00-15.00) | 7.5 (6-9) |
| | 196.58 | .00125 | 52.58±1.60 | 6.59±0.20 (5.00-10.00) | 11.8 (9-14) |
| | 192.54 | Plain bait | 42.62±4.35 | - | - |

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LITERATURE CITED

- BOYLE, M. 1960. A case of apparent resistance of Rattus norvegicus to anticoagulant poisons. *Nature* 4749: 519.
- DUBOCK, A. C., and D. E. KAUKAINEN. 1978. Brodifacoum (TalonTM rodenticide). A novel concept. Proceedings Eighth Vertebrate Pest Conference, Sacramento, California. pp. 127-137.
- MATHUR, R. P., and I. PRAKASH. 1980a. Laboratory evaluation of anticoagulant treated baits for a control of the northern palm squirrel, Funambulus pennanti Wroughton. *J. Hyg. Cam.* 85:421-426.
- MATHUR, R. P., and I. PRAKASH. 1980b. Evaluation of brodifacoum (WBA 8119) against Tatera indica, Meriones hurrianae and Rattus r. rufescens. *J. Hyg. Camb.* (in press).
- REDFERN, R., J. E. GILL, and M. R. HADLER. 1976. Laboratory evaluation of WBA 8119 as a rodenticide for use against warfarin-resistant and non-resistant rats and mice. *J. Hyg. Cam.* 77:419.
- SAXENA, Y., and R. K. SHARMA. 1981. Laboratory evaluation of brodifacoum (Talon) bait against Indian desert gerbil Meriones hurrianae Jerdon. *Pestology* 5(4):22-23.
- SAXENA, Y., and R. K. SHARMA. 1982. Relative susceptibility of zinc phosphide and brodifacoum baits to Funambulus pennanti. *Bull. Grain Tech.* 20(1) (in press).
- SONI, B. K. 1981. Efficacy of WBA 8119 (brodifacoum) to Indian rodents. *Rodent Newsletter (ICAR)* 5(4):28-29.