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THE RELATIVE EFFECTIVENESS OF TWO TYPES OF SNAP TRAPS*

PORÓWNANIE EFEKTYWNOŚCI DWÓCH TYPÓW PUŁAPEK ZATRZASKOWYCH

The relative effectiveness of Museum Special and Victor snap traps has not been tested. Both types of traps were set side by side, placed 5.5, 11, or 15 m apart on census lines or grids, baited with peanut butter, and chacked daily. During part of the study, one trap at each station was painted white alternating between Museum Special and Victor traps. There were no significant differences in the number of captures by white and plain traps of either type. However, Museum Special traps removed a larger percentage of three most abundant species combined and the two most abundant rodent species considered separately than did the Victor traps. Shrews were caught equally well by both types of traps.

INTRODUCTION

One of the many variables inherent in the estimation of small mammal densities is the effectiveness of the type of trap used to capture the animals. Some investigators have found that the use of live traps provided a better estimate of population density than did snap traps (Cocrum, 1947; Sealander & James, 1958), while others (Goodnight & Koestner, 1942) reached the opposite conclusion. Adequate comparisons of the reelative effectiveness of different snap traps have been limited (Neal & Cock, 1969).

The Museum Special and Victor mouse traps have been the two most extensively used snap traps for censusing small mammals in the USA. The effectiveness of these two traps were tested while censusing the small mammal populations at several localities in the lowland mesic--hardwood forests on the Savannah River Plant in Aiken County, South Carolina, USA. (Kaufman, Smith, Jones, Gentry & Smith, 1971). Gentry, Golley & Smith (1968) have provided a detailed description of this habitat. Also, comparisons were made of the effects of painted versus unpainted traps for capturing different small mammal species. In dense habitats, white-painted traps are more easily located when checking traps for captures.

* This study was carried out under contract AT(38-1)-310 between the University of Georgia and the United States Atomic Energy Commision.

METHODS

A valid test of the relative effectiveness of these two type of traps can be achieved when both traps are simultaneously set at the same station and baited with the same bait. Two snap traps, one Museum Special and one Victor mouse trap, were placed on lines with trap stations located either 5.5 or 11 m apart (K a u f m a n *et al.*, 1971). One of the traps at each station was marked with white enamel paint, alternating between Museum Special and Victor traps (Fig. 1). Observations on the differences in capture success of painted versus unpainted traps were collected for only the first half of the trapping period. The dimensions of the traps were as follows: Museum Special, 5 7/16 in. in length (138 mm) by 2 11/16 in. wide (68 mm); Victor, 3 14/16 in. in length (98 mm) by 1 13/16 in. wide (46 mm). Both types of traps were obtained from the Woodstream Corporation, Front Logan St., Lititz, Pa. 17543, USA.

Table 1

Chi-square analyses of the data on the trap response of each species and of the three species combined to two types of snap traps located on census lines.

Species	Trap Type	Observed Number Caught	Expected Number Captured	χ^2
P. gossypinus	Museum Special	158	111.5	
	Victor	65	111.5	
	Subtotal	223	223	38.78**
O. nuttalli	Museum Special	150	112	
	Victor	74	112	
	Subtotal	224	224	25.78**
B. brevicauda	Museum Special	22	25	
	Victor	28	25	
	Subtotal	50	50	.72
Three Species Combined	Museum Special	330	248.5	
	Victor	167	248.5	
	Subtotal	497	497	55.42**

** Significant at the .01 level.

Trapping began on January 24, 1969, and continued for a 28 day period for each of three different sets of trap lines. A total of 1386 trap stations were included in the study, which represented approximately 80,000 trap nights.

Additional data are included on the effectiveness of the trap types from two grid-trapping studies carried out during the summers of 1968 and 1969. The grid were similar to the Polish standard minimum 16×16 grid with an interstation interval of 15 m (G r o d z i ń s k i, P u c e k & R y s z k o w s k i, 1966). Information from both grid studies were combined for analysis. None of the traps were painted in these two studies. Traps were baited with peanut butter and checked daily.

Table 2

Chi-square analyses of the data on the trap response of each species and of the three species combined to painted and plain traps located on census lines.

Species	Trap Type	Observd Number Caught	Expected Number Captured	χ^2*
P. gossypinus	Painted	34	42.5	
	Plain	51	42.5	
	Subtotal	85	85	3.40
O. nuttalli	Painted	69	64	
	Plain	59	64	
	Subtotal	128	128	.78
B. brevicauda	Painted	15	15	
	Plain	15	15	
	Subtotal	30	30	.00
Three Species Combined	Painted	118	121.5	
	Plain	125	121.5	
	Subtotal	243	243	.20

*none of the χ^2 were significant at the .05 level.

Table 3

Chi-square analyses of the trap response of each species and of the three species combined to two types of snap traps for grids operated during the summers of 1968 and 1969 combined.

Species	Trap Type	Observed Number Caught	Expected Number Caught	χ^2
P. gossypinus	Museum Special	40	25	
	Victor	10	25	
	Subtotal	50	50	18.00**
O. nuttalli	Museum Special	68	41	
	Victor	14	41	
	Subtotal	82	82	35.60**
B. brevicauda	Museum Special	58	49	
	Victor	40	49	
	Subtotal	98	98	3.30
Three Species Combined	Museum Special	166	115	
	Victor	64	115	
	Subtotal	230	230	45.40**

** Significant at the .01 level.

RESULTS

During the three 28 day trapping periods, a total of 497 small mammals were captured (Table 1). The numbers of the three major species captured were: 224 golden mice *Ochrotomys nuttalli* (Harlen, 1832), 223 cotton mice *Peromyscus gossypinus* (Le Conte, 1853), and 50 short tailed shrews *Blarina brevicauda* (Say, 1823). Assuming each animal had equal access to both types of traps, significantly more captures occurred in Museum Special than in Victor traps for all species combined ($P<.01$). Only *B. brevicauda* did not show a significant difference in the number of captures between the two types of snap traps. There were no significant differences in the effectiveness of plain or white painted traps for all species combined nor for any one species considered separately ($P>.05$: Table 2).

Results from the two grid studies combined revealed that the Museum Special trap was more effective than the Victor snap trap for all species combined (Table 3). More captures occurred in Museum Specials than in Victor traps for each of the two rodent species but not for *B. brevicauda*.

DISCUSSION

The animals may have responded differently to the two trap types because of a difference in the trap composition. The Victor trap had more printer's ink stamped on its wood base and thus might have caused an avoidance reaction by the small mammals. This possibility seems unlikely since the use of white enamel paint on one-half of the traps did not significantly reduce the probability of capture for these traps. Weathering effects during rain also tended to remove most of the paint odor associated with the traps.

Additional differences in the two traps were the spring tension on the kill bar and the sensitivity of the trigger mechanism. Although the Victor trap spring tension was greater than the tension of the Museum Special, the Museum Special possessed a much more sensitive trigger mechanism. On rainy nights, nearly 100% of the Museum Special and only 10 to 20% of the Victor traps were tripped. On several occasions, there was evidence that bait on the untripped Victor traps had been partially eaten by a small mammal (droppings, teeth marks). If an animal were attracted to a trap station by the odor of the bait and fed from both traps, the probability of capture in the Museum Special trap would be greater because it trips more easily than a Victor. Sealander & James (1958) suggested a different mechanical sensitivity in live traps which led to different trap results when using Sherman and Young traps. The equal probability of capture of *B. brevicauda* in both trap types could have resulted from the carnivorous habit of more vigorously attacking its prey (or food) with less initial exploratory behavior.

Ants and other insects frequently removed the bait from traps during the course of the study; but the wooden treadle of the Museum Special was saturated with peanut oil and should attract small mammals to the

trap after all visible bait had been removed. The metal treadle of the Victor snap trap would not be as effective in this situation.

Although the Museum Special was more effective than the Victor snap trap for capturing small mammals, each of the two types of traps could be used at a trap station. The Victor trap is useful during rainy periods when most of the Museum Special traps are tripped. More than one of each trap type might be used in areas of high density. In this study, the number of multiple captures at one station was only 10 out of a total of 497 small mammals captured.

The two types of snap-traps used in this study were only effective for capturing animals which weighed less than fifty grams. Neither type of trap was effective for capturing animals as large as the cotton rat *Sigmodon hispidus* Say & Ord, 1825 (84 g). Wood rats *Neotoma floridana* (Ord, 1818) (237 g) were occasionally stunned by the traps, but rarely killed.

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OXYGEN CONSUMPTION IN STARVING SHREWS

ZUŻYCIE TLENU U GŁODUJĄCYCH RYJÓWEK

The experiments were carried out on fed and starving shrews — *Sorex minutus, S. araneus* and *Neomys fodiens*. The hypothesis suggesting the ability of shrews to fall into the state of reversible hypothermy under the effect of lack of food was not confirmed.

Bashenina (1965) suggested that shrews devoid of food in cold surroundings are not able to maintain normal body temperature. This supposition was based on the measurement of oxygen consumption in