

## Studies on the Food Habits of Rats V. Feeding Preferences of Some Field Mice for a Scent Rice.

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### 17. ネズミの食性に関する研究 V. 数種の野ネズミのニオイ米に対する嗜好性

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ニオイ米(品種:ヒエリ)に対する野ネズミの嗜好性を知るため, 3種類の野ネズミを用いて室内試験を行なった。アカネズミはニオイ米を好み, 穀粒もしくはニオイ米を高濃度に含んだ混合餌をよく摂取した。ハツカネズミおよびハクネズミはニオイ米には引かれなかったが, ニオイ米の適量の添加によって混合餌の摂取性が高まる結果を得た。

In the previous paper<sup>1)</sup>, the authors reported that a variety of scent rice, Hieri was preferred by Norway rats, and the intake of cereal bait mixtures was increased when proper quantity of the scent rice was incorporated into the bait mixture.

In the present paper, the authors report the food preferences of three species of field mice<sup>2)</sup> for the scent rice (Hier) and an ordinary rice (Sasanishiki). The results show that both varieties of rice were taken about equally by *Microtus montebelli* and *Mus musculus*, whereas *Apodemus speciosus* preferred scent rice to ordinary rice even though both varieties of rice were available.

#### Materials and Method

The animals used were laboratory colonies of Japanese field vole, *Microtus montebelli*, Japanese field mouse, *Apodemus speciosus* and Japanese house mouse, *Mus musculus* which had been reared in the laboratory. In advance of the tests, the infant animals from the same litter were separated from their mother and confined in a large breeding cage every group.

The test baits used were two varieties of rice, Hier and Sasanishiki. Hier is a variety of scent rice as mentioned in the previous paper<sup>1)</sup>. Sasanishiki is an ordinary rice which has been popularly consumed by Japanese people. Both varieties of rice were tested in unmilled grains

and finely powdered forms.

The test cage is consisted of stainless wire-netting, 26cm×30cm, and 17cm in height with a netted door in the side wall. Bait container is consisted of glass dish, 7cm in diameter and 4.5cm in height.

An individually caged rat was allowed to choose a paired baits for 24 hours. Two dishes with the excessive amount of test baits were placed to either corner of the cage at the same time.

The baits were renewed and their positions were changed every day to eliminate bias due to place preference.

#### Results and Discussion

Each test group was consisted of four adult mice of equal sex ratio. Each test was repeated four times. Average daily consumption of the test baits was calculated and indicated per 100g body weight of test animals.

Table 1 shows the preferences of field mice for two varieties of rice grains. There were little differences between Hier and Sasanishiki in the daily consumption by *Microtus* and *Mus*, though Hier was somewhat preferred when it was mixed with ordinary rice in the lower proportion. *Apodemus* preferred Hier to Sasanishiki, but this field mouse did not distinguish scent rice when it was mixed in a low proportion.

Table 2 shows the preference of *Apodemus*

Table 1. Comparison of the daily consumption of two varieties of rice grains by three species of field mice in an individual feeding test during four day periods.

Test bait Standard rice* plus:	Consumption/100g body w./day			n	Chi-square Significance p=0.05	Average of body weight (no. of mouse)
	Test bait	Standard rice*	Total taken			
<i>Microtus montebelli</i>						
Hieri 100%	8.1	8.5	16.6	16	N.S.	32.0(4)
50	9.2	6.5	15.7	16	N.S.	32.0(4)
25	8.9	2.8	11.7	16	*	32.0(4)
Hieri only	16.6	—	16.6	8		30.3(4)
Standard only	—	14.5	14.5	8		32.0(4)
<i>Apodemus speciosus</i>						
Hieri 100%	6.2	4.3	10.5	16	*	40.0(4)
50	6.0	4.2	10.2	16	*	42.0(4)
25	6.5	6.2	12.7	16	N.S.	40.0(4)
Hieri only	11.9	—	11.9	8		42.0(4)
Standard only	—	10.1	10.1	8		42.0(4)
<i>Mus musculus</i>						
Hieri 100%	9.1	11.2	20.3	16	N.S.	17.0(4)
50	13.6	12.5	26.1	16	N.S.	16.8(4)
25	12.7	8.7	21.4	16	*	18.5(4)
Hieri only	21.7	—	21.7	8		16.8(4)
Standard only	—	19.9	19.9	8		16.8(4)

\* Sasanishiki used as a standard rice.

for the bait mixtures in various proportions of powdered rice and wheat flour. There were no significant differences in the amount of daily consumption among the test baits.

Nevertheless, *Apodemus* seems to prefer bait with higher proportion of scent rice in the bait mixture. It is a clear evidence that this field mouse preferred Hieri to Sasanishiki when both rice grains were compared at the same time as shown in Table 1.

Tables 3 and 4 show the preferences of *Mus musculus* and *Microtus montebelli* for the test baits. Although there were considerable differ-

ences in the results of the feeding tests, empirically it may be considered that there was little or no difference in the daily consumption between each paired baits. The statistical differences may be due to the wide variations appeared occasionally in the amount of consumption between the test baits. In spite of the bait positions were changed every day to eliminate the possibility of bias due to place preference, there was prejudice in favor of either of the paired baits so that mice taken whichever bait capriciously. The results have suggested that rice is less attractive for these mice, and it may be available

Table 2. Daily bait consumption of Japanese field mouse, *Apodemus speciosus* when each paired baits was provided for four days.

Test bait Wheat flour plus:	Consumption/100g body w./day			n	Chi-square Significance p=0.05	Average of body weight (no. of mouse)
	Test bait	Wheat flour	Total taken			
Hieri						
0.5%	4.7	5.9	10.6	16	N.S.	40.0(4)
1.0	5.3	5.2	10.5	16	N.S.	42.0(4)
5.0	7.0	4.9	11.9	16	N.S.	42.0(4)
10.0	8.1	4.1	12.2	16	N.S.	40.0(4)
20.0	8.6	4.3	12.9	16	N.S.	40.0(4)
Sasa*						
0.5%	5.8	5.3	11.1	16	N.S.	40.0(4)
1.0	6.9	5.8	12.7	16	N.S.	42.0(4)
5.0	6.6	5.0	11.6	16	N.S.	40.0(4)
10.0	7.6	4.4	12.0	16	*	42.0(4)
20.0	7.0	5.9	12.9	16	N.S.	39.8(4)

\* Sasanishiki used as a standard rice.

Table 3. Daily bait consumption of Japanese house mouse, *Mus musculus* when each paired baits was provided for four days.

Test bait Wheat flour plus:	Consumption/100g body w./day			n	Chi-square Significance p=0.05	Average of body weight (no. of mouse)
	Test bait	Wheat flour	Total taken			
Hieri						
0.5%	12.2	10.4	22.6	16	N.S.	18.5(4)
1.0	13.6	12.2	25.8	16	N.S.	16.8(4)
5.0	15.2	9.7	24.9	16	*	18.5(4)
10.0	14.6	13.1	27.7	16	N.S.	16.8(4)
20.0	15.5	8.0	23.5	16	*	18.5(4)
Sasa*						
0.5%	12.9	11.7	24.6	16	N.S.	18.5(4)
1.0	10.9	15.0	25.9	16	*	16.8(4)
5.0	18.5	10.4	28.9	16	*	18.5(4)
10.0	13.3	15.7	29.0	16	*	16.8(4)
20.0	18.8	8.4	27.2	16	*	18.5(4)

\* Sasanishiki used as a standard rice.

Table 4. Daily bait consumption of Japanese field vole, *Microtus montebelli* when each paired baits was provided for four days.

Test bait Wheat flour plus:	Consumption/100g body w./day			n	Chi-square Significance p=0.05	Average of body weight (no. of mouse)
	Test bait	Wheat flour	Total taken			
Hieri						
0.5%	9.5	9.4	18.9	16	N. S.	31.0(4)
1.0	8.3	10.3	18.6	16	N. S.	26.5(4)
5.0	13.1	8.9	22.0	16	*	28.8(4)
10.0	13.6	4.0	17.6	16	*	30.5(4)
20.0	15.2	6.0	21.2	16	*	28.8(4)
Sasa*						
0.5%	8.9	5.1	16.0	16	*	29.3(4)
1.0	5.7	7.8	13.5	16	*	29.3(4)
5.0	9.6	7.4	17.0	16	*	29.8(4)
10.0	15.6	4.6	20.2	16	*	29.0(4)
20.0	14.6	5.2	19.8	16	*	28.8(4)

\* Sasanishiki used as a standardrice.

as a staple food for them. If remotely compared, the addition of 5 to 25% of scented rice may increase the acceptability of the cereal bait mixtures.

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#### Summary

To know the food preferences of three species of field mice for a scented rice, some feeding tests were carried out in the laboratory conditions.

The results showed that a scented rice, Hieri is attractive for Japanese field mouse, *Apodemus*

*speciosus* when it used as a grain or a bait with higher proportion of scented rice in the bait mixture.

Hieri is less attractive for Japanese house mouse, *Mus musculus* and Japanese field vole, *Microtus montebelli*, while it may be available as a bait enhancer when the proper quantity of the powdered rice is added to the bait mixture.

#### References

- 1) Naganuma, K. and Y. Ikeda: *Botyu-Kagaku*, 42, 111 (1977).
- 2) Rodent Control Terms Committee: Rodent Control Terms, 30, *Japan Plant Protection Association* (1976).