

THE SWAMP RICE RAT (*ORYZOMYS PALUSTRIS NATATOR*)
AS A POSSIBLE LABORATORY ANIMAL FOR
SPECIAL PURPOSES

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INTRODUCTION

The Florida cotton rat, *Sigmodon hispidus*, has become established as a laboratory animal largely because it is the best known host of the filariid worm, *Litomosoides carinii*, which is used in routine screening tests for filariacides.

Cotton rats are unsuitable for infecting when very small, and as the filariae take several months to develop enough for the purpose of the test, most of the cotton rats are fully grown at the time of testing. Their weight range is 125–225 g., average about 170 g.

Since 5–10 doses are used routinely in the screening of antifilarial compounds, an experimental animal of lower weight would be an obvious advantage. The swamp rice rat has a mature weight of about half that of the cotton rat. Because there was no information concerning the suitability of the swamp rice rat as an experimental host for filariae a small number was imported to investigate the possibility of their replacing cotton rats for this test.

A dozen specimens (seven males and five females) which had been trapped in Florida were imported in February 1949, and two generations have since been bred.

In this paper, certain observations concerning breeding, feeding and handling are reported.

Management

The rice rats have been kept in ordinary wire rat cages (1 ft. 9 in. × 1 ft. × 8 in.) in which some at least have paired. Greater freedom might be advantageous for mating, but considering that the stock was composed of trapped wild specimens the breeding performance can be regarded as satisfactory, for three out of five wild females each produced several litters.

The bedding used was sawdust, and hay was provided with which pregnant females weave globular nests into which they take their food. If the male is present he also makes a nest in another corner of the cage.

Before introducing strange rats to one another both were sprayed with a weak disinfectant solution to mask their personal odours and reduce antagonism.

The male was generally removed from the female's cage as soon as pregnancy was obvious. This practice is necessary, at least at this stage of domestication, to reduce deaths by cannibalism. Cannibalism by the mate was the most frequent cause of death; both sexes suffered equally.

Diet

Diet was of ordinary rat cubes as supplied by Scottish Agricultural Industries Ltd., Edinburgh, supplemented with carrots. Water was continuously available in standard drinking bottles.

Gestation period

The gestation period is probably between 21 and 24 days. Observed time intervals between exposure to the male and parturition, males being removed only when pregnancy was diagnosed, were 22, 23–26, 27, 30, 32, 35 and 35 days.

Table 1. *Causes of death among rice rats*

	No.	Surviving	Cannibalized	Natural death
Original rats	7 ♂	3 ♂	2 ♂	2 ♂
	5 ♀	1 ♀	3 ♀	1 ♀
1st generation	11 ♂	7 ♂	2 ♂	2 ♂
	10 ♀	8 ♀	2 ♀	—
2nd generation	14 ♂	13 ♂	1 ♂	—
	1 ♀	1 ♀	—	—

Table 2. *Weights of adult rice rats*

	Sex, ♂															
Rice rat no.	8	10	15	19	23	25	31	33	43	45	49	57	63*	65*	67*	69
Weight in g.	110	88	130	70	94	80	122	72	121	120	130	68	104	83	52	51
	Sex, ♀															
Rice rat no.	2	14	18	20	22	24	26	30	32	34						
Weight in g.	94	127	72	48	55	63	90	66	54	82						

♂ range 68–130 g. Average (excluding *63–69, which were only 4 months old) = 100 g.
 ♀ range 48–127 g. Average = 75 g.

Size of litter

In ten litters the total number of young was forty-one, or an average of approximately four.

Frequency of breeding

Has not been fully ascertained but one female produced three litters in 5 months.

The young

At birth the young rice rats are almost naked, but their fur quickly grows. Their eyes remain closed for 4–5 days, and they soon become very active.

The adult

Males are considerably larger than the females and their average weight is about 100 g., whereas the average weight of the females is approximately 75 g. The fur of both sexes is rather darker than that of the Norwegian brown rat and much softer. In the only paper seen on this rodent (Hamilton, 1946) it was stated that the species was docile, but this is not a striking characteristic of the rice rats bred here. It has been observed that the cotton rat bites occasionally when handled, but the rice rat will bite before being handled. The rice rats bred here have been

handled very little; probably later laboratory-raised generations handled more frequently will become quieter, as have cotton rats.

Possible uses

The susceptibility of the rice rat to infections which do not normally take well in other laboratory animals might be investigated. Their size and weight range are suitable for routine chemotherapeutic testing, as they are considerably smaller than both cotton rats and white rats. Preliminary investigations indicate that the rice rat is not a suitable host for the cotton rat filariid worm, *Litomosoides*.

REFERENCE

HAMILTON, W. J., Jnr. (1946). *Amer. Midl. Nat.* 36, 730.

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