

Sponsor: Nature-Cide  
Study: Rat & Mouse Repellent  
Sponsor Code: N/A

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**REPORT TITLE**

Evaluation of the Nature-Cide Rat &amp; Mouse Repellent

**STUDY**

Nature-Cide Rat &amp; Mouse Repellent

**TRIALS**

MUSXMU &amp; RATTNO

**SPONSOR CODE**

N/A

**EXPERIMENTAL START DATE**

January 12, 2014

**EXPERIMENTAL COMPLETION DATE**

June 4, 2014

**REPORT DATE**

March 2016



**NON-GLP STUDY REPORT**

Date: March 2016

Sponsor: Nature-Cide

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Sponsor Code: N/A

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**STATEMENT OF NO DATA CONFIDENTIALITY CLAIMS**

No claim of confidentiality, on any basis whatsoever, is made for any information contained in this document. I acknowledge that information not designated as within the scope of FIFRA §10(d)(1)(A), (B), or (C) and which pertains to a registered or previously registered pesticide is not entitled to confidential treatment and may be released to the public, subject to the provisions regarding disclosure to multinational entities under FIFRA 10(g).

Submitter: \_\_\_\_\_ Date: \_\_\_\_\_

Typed Name of Signer: \_\_\_\_\_

Typed Name of Company: Pacific Shore Holdings, Inc.

**COMPLIANCE STATEMENT**

This study was NOT conducted in compliance with Good Laboratory Practice Standards as described by EPA (40 CFR Parts 160 and 792), and was never intended for that purpose.

Test Facility Management:



Eric J. Snell  
Snell Scientifics, LLC.

Date: 03/03/16

Study Director:



Todd Smith  
Snell Scientifics, LLC.

Date: 03/03/16

Sponsor:

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Date: 

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Submitter:

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Date: 

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**STUDY OBJECTIVE(S):**

To evaluate the Nature-Cide Rat & Mouse Repellent formulation for repelling mice and rats.

**TEST SUBSTANCE INFORMATION:****Test Substance:**

1. Nature-Cide Rat & Mouse Repellent

**TEST SYSTEM INFORMATION:**

| <b>Trial</b> | <b>Test System</b>                           | <b>Strain</b> | <b>Stage/Age</b> | <b>Source</b>         |
|--------------|----------------------------------------------|---------------|------------------|-----------------------|
| MUSXMU       | House Mice ( <i>Mus musculus</i> )           | Lab           | Mixed            | Purchased /<br>Reared |
| RATTNO       | Laboratory Rats ( <i>Rattus norvegicus</i> ) | Lab           | Mixed            | Purchased /<br>Reared |

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**MATERIALS AND METHODS:**

The following is the Snell Scientifics Standardized Testing Method for evaluating the reduction of rodent activity in treated areas caused by repellents. Select action items and illustrations have been removed from this standardized test method in an effort to make the report more precise and accurate to the study conducted. Any details removed from this test method were deemed irrelevant to the study conducted in this report.

**4210.1 Materials:****420.1.1 The mouse ‘Choice Test Arenas’ consisted of the following:**

- 420.1.1.1 Three (3) 2-gallon plastic bucket quadrants per arena. The buckets were 8” dia. x 9.25” h. (~50 sq. in. floor area).
- 420.1.1.2 The buckets were labeled as the ‘Introduction Section (IS)’ (middle bucket), ‘Right Side Choice (RSC)’ (right bucket), or ‘Left Side Choice (LSC)’ (left bucket).
- 420.1.1.3 The ‘Introduction Section (IS)’ had two (2) 2.25” dia. holes that were ½” from the bottom of the bucket and on opposite sides from each other. The ‘Right Side Choice (RSC)’ and ‘Left Side Choice (LSC)’ each had one (1) 2.25” dia. hole that was also ½” from the bottom of the buckets.
- 420.1.1.4 2” dia. x 36” length PVC pipes were placed in the 2.25” holes and connected the ‘Introduction Section (IS)’ to the ‘Right Side Choice (RSC)’ and the ‘Left Side Choice (LSC)’ buckets. This provided a runway between each bucket.
- 420.1.1.5 Each bucket was covered with a 9” dia. lid (constructed of ¼” hardware cloth) to allow air flow but prevent escapes.

**420.1.2 The rat ‘Choice Test Arenas’ consisted of the following:**

- 420.1.2.1 Three (3) 5-gallon plastic bucket quadrants per arena (~80 sq. in. floor area).
- 420.1.2.2 The buckets were labeled as the ‘Introduction Section (IS)’ (middle bucket), ‘Right Side Choice (RSC)’ (right bucket), or ‘Left Side Choice (LSC)’ (left bucket).
- 420.1.2.3 The ‘Introduction Section (IS)’ had two (2) 3.5” dia. holes that were ½” from the bottom of the bucket and on opposite sides from each other. The ‘Right Side Choice (RSC)’ and ‘Left Side Choice (LSC)’ each had one (1) 3.5” dia. hole that was also ½” from the bottom of the buckets.
- 420.1.2.4 3” dia. x 36” length PVC pipes were placed in the 3.5” holes and connected the ‘Introduction Section (IS)’ to the ‘Right Side Choice (RSC)’ and the ‘Left Side Choice (LSC)’ buckets. This provided a runway between each bucket.
- 420.1.2.5 Each bucket was covered with a lid with air holes (to allow air flow but prevent escapes).

**420.1.3 Harborage/Water:** Nesting material and a water source was provided in the ‘Introduction Section (IS)’.**420.1.4 Disposable paper plates:** Used in each side bucket to apply the test substances onto.

- 420.1.5 100mm plastic Petri lids: Equipped with a vertical metal rod to hold the non-toxic bait blocks in the RSC and LSC buckets.
- 420.1.6 Non-Toxic Bait Blocks: Used to monitor feeding activity in each side bucket.
- 420.2 Methods:
- 420.2.1 The nesting material and water were placed in the Introduction Section (IS).
- 420.2.2 For the mice, the test substance was applied as a 'band' application on the outer edge of the paper plates using approximately 1 gram per bucket. The test substance was placed in either the 'Right Side Choice (RSC)' or 'Left Side Choice (LSC)' bucket. One side was treated and one side was left as un-treated. The treated and un-treated sides were rotated between different test replicates.
- 420.2.3 For the rats, the test substance was applied on the paper plates using 2.5 grams and/or 5 grams per bucket. The test substance was placed in either the 'Right Side Choice (RSC)' or 'Left Side Choice (LSC)' bucket. One side was treated and one side was left as un-treated. The treated and un-treated sides were rotated between different test replicates.
- 420.2.4 An approximate 10 gram (mice) and/or 25 gram (rats) non-toxic bait block was placed in the center of the paper plate in both the 'Right Side Choice (RSC)' and 'Left Side Choice (LSC)' buckets. The exact weight of the blocks was documented prior to placing them inside the buckets.
- 420.2.5 One (1) mouse and/or rat was placed into the 'Introduction Section' and was left un-disturbed for approximately 24 hours.
- 420.2.6 After the 24 hour period, the post-weights of each bait block (on treated and un-treated sides) were documented and the total number of droppings on each side (treated and un-treated) were documented.
- 420.2.7 The test substance was evaluated at various days after aging and each aged evaluation was replicated at least 8 times.
- 420.2.8 The repellency was calculated based on the amount feeding activity (grams consumed) and the number of droppings that were recorded in the treated buckets compared to the same observations in the un-treated buckets.

**RESULTS / DISCUSSION:**

The results of this study are tabulated in Tables 1 and 2. Each table shows the percent repellency of the rodents following the Nature-Cide Rat & Mouse Repellent treatments, with Table 1 showing the mouse repellency results and Table 2 showing the rat repellency results.

As is shown in the Table 1, the Nature-Cide Rat & Mouse Repellent was evaluated against the mice at 29, 43, and 57 days after aging. The 29 and 43 day aged evaluations recorded similar mouse repellency rates, with 61% and 66% respectively. The day 57 evaluation recorded a substantial reduction in mouse repellency, with an average of 22%.

For the rat evaluations (Table 2), the Nature-Cide Rat & Mouse Repellent was evaluated using a 2.5 and a 5 gram application rate. Each rate was evaluated at day 1 and then again at various days up until 43 (2.5 gram rate) and 83 days (5 gram rate) after aging. Of the different aged evaluations with the low rate (2.5 grams), the day 1 evaluation recorded the highest rat repellency at 58%, with 18%-40% rat repellency during the 15, 31, and 43 day aged evaluations. The high rate (5 grams) recorded a high of 63% repellency (34 days), with 18%-48% repellency rates during all other aged evaluations (1, 22, 46, 60, 72, and 83 days).

**CONCLUSION:**

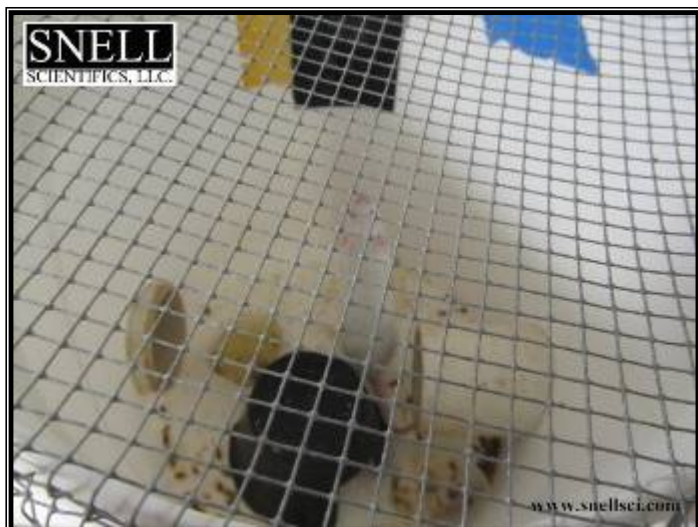
It is evident from the results of the study that the Nature-Cide Rat & Mouse Repellent has the ability to repel both mice and rats for an extended period of time. In most cases the Nature-Cide Rat & Mouse Repellent was most effective during the shortest aged evaluations, and it continued to provide measurable repellency for several weeks after aging with each application rate.

**TABLES:****Table 1.**

| Mouse Repellency of the Nature-Cide Rat & Mouse Repellent |                 |              |
|-----------------------------------------------------------|-----------------|--------------|
| Application Rate                                          | Aged Evaluation | % Repellency |
| 1g/bucket                                                 | 29 Days         | 61%          |
|                                                           | 43 Days         | 66%          |
|                                                           | 57 Days         | 22%          |

**Table 2.**

| Rat Repellency of the Nature-Cide Rat & Mouse Repellent |                 |              |
|---------------------------------------------------------|-----------------|--------------|
| Application Rate                                        | Aged Evaluation | % Repellency |
| 2.5g/bucket                                             | 1 Day           | 58%          |
|                                                         | 15 Days         | 39%          |
|                                                         | 31 Days         | 40%          |
|                                                         | 43 Days         | 18%          |
| 5g/bucket                                               | 1 Day           | 40%          |
|                                                         | 22 Days         | 48%          |
|                                                         | 34 Days         | 63%          |
|                                                         | 46 Days         | 18%          |
|                                                         | 60 Days         | 37%          |
|                                                         | 72 Days         | 33%          |
|                                                         | 83 Days         | 29%          |

**APPENDIX A: PHOTOGRAPHS****Photograph 1.** Mouse Choice Arenas**Photograph 2.** Mouse Introduction Chamber with Harborage, Water Source, and Mouse

**Photograph 3.** Un-Treated Side with Non-Toxic Bait Block



**Photograph 4.** Treated Side with Non-Toxic Bait Block



**Photograph 5.** Rat Choice Arenas



**Photograph 6.** Rat Introduction Chamber with Harborage & Water Source



**Photograph 7.** Un-Treated Side with Non-Toxic Bait Block

