



Mission: Allergy, Inc.
Bed Bug Escape Prevention
ICR Project No. 472-0030
In-Life Completion: September 27, 2010

PROJECT NO:
472-0030

STUDY TITLE
EVALUATION OF THE EFFICACY OF MATTRESS CASINGS
FOR PREVENTION OF BED BUG ESCAPES

IN-LIFE COMPLETION DATE:
September 28, 2010

STUDY COORDINATOR:
Genoveva Collins

PERFORMED FOR:
Mission: Allergy, Inc.
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EXECUTIVE SUMMARY

The zipper used in the Mission: Allergy Premium Microfiber and Mission: Allergy Barrier II mattress casings was tested for its ability to prevent bed bug escapes. Ten first instar bed bugs were placed in a 16 oz. plastic container. The top of the container was covered with the section of the test fabric with the zipper. The fabric was sealed to the outside of the container with tape such that the only way for the bed bugs to escape was through the zipper. A heating pad set to low (31 – 32 °C) along with a bed bug-scented piece of filter paper were placed outside the zipper as an enticement for the bed bugs to escape. Three test containers were set up. Three control containers with the zipper unzipped were also set up. The containers were allowed to set overnight (14 hours) and observed in the morning.

None of the bed bugs in the test containers had escaped, whereas an average of 73% of the bed bugs in the control containers escaped.

Genoveva M Collins 10.04.10
Genoveva Collins Date
Study Coordinator



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OBJECTIVE:

To test the ability of mattress casings in preventing bed bug escapes.

This is not a GLP (Good Laboratory Practices, as defined by 40 CFR part 160) protocol, and the final report is not intended to be submitted to any regulatory agency as part of a GLP study or to support product registration.

MATERIALS:

- TEST FABRIC: The zipper in the Mission: Allergy Premium Microfiber fabric was tested. Since the zipper in the Mission: Allergy Barrier II fabric is the same as that in the Mission: Allergy Premium Microfiber fabric, it was not tested.
- TEST ORGANISMS: First instar bed bugs from the ICR colony (*Cimex lectularius*) reared at ambient indoor temperatures and humidities. This colony was obtained from the USDA Gainesville lab in July 1983.
- CONTAINERS: 16 oz. plastic jars 4 in. high x 3.5 in. in diameter.
- ARENAS: Plastic container (19.5 x 13.5 x 8.5 inches high)
- MISCELLANEOUS: Forceps, rubber bands/tape, source of CO₂, double sided sticky tape, scotch tape, carpet tape, fluon, heating pad, petri dish, old bed bug filter paper.

METHODS:

Summary

Ten first instar bed bugs were placed in a 16 oz. plastic container. The top of the container was covered with the section of the test fabric with the zipper. The fabric was sealed to the outside of the container with tape such that the only way for the bed bugs to escape was through the zipper. A heating pad set to 31 – 32 °C along with a bed bug-scented piece of filter paper were placed outside the zipper as an enticement for the bed bugs to escape. Three test containers with the interior flap of material positioned against the zipper were set up. Three control containers with the zipper unzipped were also set up. Each container was placed in an arena treated with fluon to prevent any loose bed bugs from escaping into the test room. The containers were allowed to set

overnight (14 hours) and observed in the morning.

Sample Handling and Storage

The samples were logged in when received and stored in a locked cabinet at ambient temperature and humidity until the study date.

Replication

Three replications of test fabrics and control fabrics were tested.

Handling of Bed Bugs

The bed bugs had not received a blood meal within 2 weeks prior to the test to ensure that they were hungry. Bed bugs were anesthetized with CO₂ and then placed individually into vials until used in the test.

DATA ANALYSIS:

The numbers of bed bugs escaping through the zipper of the test fabric were compared.

RESULTS:

None of the bed bugs in any of the three test containers were able to escape through the zippers of the Mission: Allergy Premium Microfiber fabrics, Appendix I, whereas an average of 73% of the bed bugs in the control containers where the zippers were unzipped escaped, Table 1.

| Rep | Control % Escaped | Test % Escaped |
|------------|------------------------------|---------------------------|
| 1 | 60 | 0 |
| 2 | 80 | 0 |
| 3 | 80 | 0 |
| Avg | 73 | 0 |

CONCLUSIONS:

The zipper in the Mission: Allergy Premium Microfiber mattress casing was completely effective in preventing first instar bed bugs from escaping.



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APPENDIX I: RAW DATA SHEETS

EVALUATION OF THE EFFICACY OF MATTRESS CASINGS TO PREVENT BED BUG ESCAPE

Bed bug Strain: ICR Lab

1st instar Bed bug nymphs per replicate (Rep.) : 10

Control: **OPEN** Zipper or Treated: **CLOSED** Zipper (Circle one)

| | |
|---------------------------|----------------|
| Release of bed bug nymphs | |
| Date/time | 9/27/10 5:00pm |

| | |
|--------------------|-----------------|
| Collection of Data | |
| Date/time | 9/28/10 7:30 am |

| Reps | Confined* | Escaped ** |
|------------|-----------|------------|
| 1 | 4 | 6 |
| 2 | 2 | 8 |
| 3 | 2 | 8 |
| Total (30) | 8 | 22 |
| Mean | 0.26 | 0.73 |

| | | |
|------------|-------------|---------|
| Release | Temp: 78 °F | RH 53 % |
| Collection | Temp: 76 °F | RH 51 % |

Recorder's Initials/Date:

YC 9/28/10

Study Coordinator :

Donna...

* Did not get through zipper

** Escaped through zipper into the arena

EVALUATION OF THE EFFICACY OF MATTRESS CASINGS TO PREVENT BED BUG ESCAPE

Bed bug Strain: ICR Lab

1st instar Bed bug nymphs per replicate (Rep.) : 10

Control: **OPEN** Zipper or Treated: **CLOSED** Zipper (Circle one)

| | |
|---------------------------|----------------|
| Release of bed bug nymphs | |
| Date/time | 9/27/10 5:00pm |

| | |
|--------------------|----------------|
| Collection of Data | |
| Date/time | 9/28/10 7:30am |

| Reps | Confined* | Escaped ** |
|------------|-----------|------------|
| 1 | 10 | 0 |
| 2 | 10 | 0 |
| 3 | 10 | 0 |
| Total (30) | 30 | 0 |
| Mean | 100 | 0 |

| | | |
|------------|-------------|---------|
| Release | Temp: 78 °F | RH 53 % |
| Collection | Temp: 76 °F | RH 51 % |

Recorder's Initials/Date:

JK 9/28/10

Study Coordinator :

Denorena M. Loh

* Did not get through zipper

** Escaped through zipper into the arena