Microbe Investigations AG

LS24-04155

Report date: January 07, 2025

Customer: TEVO Creations Sdn Bhd

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SWISS TECH INSIDE

Microbe Investigations AG (MIS) is a spin-off company of ETH Zürich

MIS provides microbiological testing services primarily for industrial customers assessing the characteristics of developmental products. MIS also provides a depth of expertise in fundamental aspects of microbiology gained throughout many years of world-leading research. Target customers are primarily companies working with antimicrobial treatments on textiles, plastics, and coatings.

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Test report overview

General Info	Name	Contact	Key Account Manager
Customer	TEVO Creations Sdn Bhd	Kern Ng	-
Distributor	-	-	-
Brand customer	BerryC	-	-
Brand label	-	Application at	-
Reason for testing	Customer Quality Validation (CQV)	Application by	Not specified
Email address	sales@tevocreations.com	Scale	-

Test methods carried out in this report: Repellence of bed bugs up to 10 hours on fabric & petri dish surface.

1. Aims of the Test: To evaluate the repellence of the product against Bedbugs *Cimex lectularius*.
2. Reference guidance: US EPA 2017, OCSPP 810.3900, Petri dish Repellency assay test against *Cimex lectularius* bed bugs
3. Test results: 100% repellence effect up to 10 hours.
4. Test summary / comments:

   In the Test Method "Repellence test against Bedbugs *Cimex lectularius*" the Sample "BerryC" showed 100% repellence effect up to 10 hours after spray on the fabric against bedbugs *Cimex lectularius.*

Test Product Details

Name: BerryC

Batch no.: NA, provided by the sponsor (on date: 24/12/2024)

Formulation: The product is a liquid suspension Ready-To-Use.

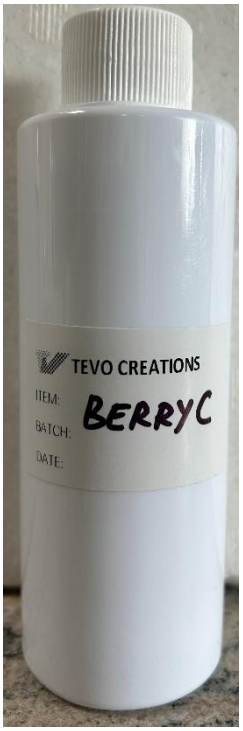

Fig: Test Product-BerryC

Test details

Scope: The test is conducted to evaluate the efficacy of a spray product when applied on fabric, measuring parameters such as repellence effect over a set time-period.

MATERIAL AND METHODS

1. Material

1.1 Target species: *Cimex lectularius,* 10 adults' bedbugs in an equal sex ratio.

1.2 Spray Applicator: Ready-To-Use product, spray applicator with deliver a specific dosage of 0.1ml per trigger

2. Method

2.1 Description:

The product is directly sprayed on the fabric and visually dry. Half the petri dish is covered with treated fabric and the other half is untreated fabric. Bedbugs are introduced into the petri dish. The repellence effect and mortality are recorded.

2.2 Replicates: A minimum of 1 independent replicate are performed

2.3 Testing conditions:

- Temperature: 22 ± 4 °C
- Relative humidity: 30-70%

2.4 Definitions:

- Attractant: It is a substance that lures ants to a specific point, e.g. a trap, or increases the palatability of a bait.
- Mortality: It refers to death of the individual ant. A dead ant is an ant that does not move, even when poked or probed.
- Repellent: A substance, causing ants to avoid a treated substrate (e.g., disrupting the host-seeking or shelter-seeking behavior of ant).
- Knock down: It is defined as a temporary or permanent inability to move.

2.5 Test Equipment: Petri dish (Size-90mm diameter, 15mm depth)

2.6 Bedbugs rearing, handling, and maintenance:

Bedbugs are reared in the laboratory and maintained at temperature of 22 ± 4 °C, with a relative humidity of 40-60%, and a photoperiod ranging from L:D 12:12 h to L:D 16:8 h. Bedbugs are fed on human host.

2.7 Procedure

- Cut the Cotton fabric to fit the bottom of the Petri dish.
- Treated one half of the fabric with the repellent product. Leave the other half untreated as a control.
- Allowed the treated fabric to dry completely.
- Placed the treated and untreated fabric halves in the Petri dish.
- Introduced 10 bedbugs into the center of the Petri dish.
- Observes the movement of bedbugs over a set period. Such as 10 minutes, 1 hour, 4 hours and 10 hours.
- Recorded the number of bedbugs on the treated and untreated sides of the fabric.
- Calculate the percentage of bedbugs repelled by the treated area compared to the control.

2.8 Repellency Percentage: Calculate the percentage of bedbugs by counting the number of bed bugs on treated sample versus untreated sample at each recorded time point.

Test results

1. Evaluation parameters: The number of bedbugs found on the specimen at each interval of time.

Table 1: Number of bedbugs on the Control (without spray) & Treated (after spray) at each interval of time.

Duration	Control (Without Spray)	Treated (Sprayed with BerryC)
10 minutes	10	00
1 hour	10	00
4 hours	10	00
10 hours	10	00

The percentage repellence is calculated by the number of bedbugs on control – number of bedbugs on the treated by number of bedbugs on control multiplied by 100.

Calculation: Percent repellence

$$\% \text{ Repellence} = \frac{\text{Number of bedbugs on control} - \text{Number of bedbugs on Treated}}{\text{Number of Bedbugs on control}} \times 100$$

Table 2: Repellency assay: % of bedbugs repelled or dead.

Observation	Treated
% of bedbugs repelled in 10 minutes	100% repelled
% of bedbugs repelled in 1 hour	100% repelled
% of bedbugs repelled in 4 hours	100% repelled
% of bedbugs repelled in 10 hours	100% repelled

Conclusion:
The Sample "BerryC" showed 100% repellence effect up to 10 hours against Bedbugs *Cimex lectularius* when tested as per US EPA 2017, OCSPP 810.3900.