

NAC 039/2022

**VIRCAST MEDIC SDN. BHD.
NO 110 & 111 JALAN PENGKALAN
TAMAN PEKAN BARU
08000 SUNGAI PETANI
KEDAH**

FINAL REPORT

TITLE

**LABORATORY EVALUATION OF REPELLENT PRODUCTS, INVISIBLE
NATURAL BAD BUGS REPELLENT (DRBEDBUG) AGAINST *Aedes*
aegypti, USING THE BIOASSAY METHOD FOR MOSQUITO REPELLENT
ON HUMAN SKIN**

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**DATE SAMPLE/S RECEIVED: 8 November 2022
DATE TEST STARTED: 9 November 2022
DATE TEST COMPLETED: 10 November 2022
DATE OF THE FINAL REPORT: 14 November 2022**

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VCRU**

1.0 TITLE

Laboratory evaluation of Repellent products, **Invisible Natural Bad Bugs Repellent (DrBedBug)** against *Aedes aegypti*, using the Bioassay Method for Mosquito Repellent on Human Skin

2.0 OBJECTIVES

To evaluate the bio efficacy of Repellent products, against *Aedes aegypti* using the Bioassay Method for Mosquito Repellent on Human Skin

3.0 RESEARCH PERSONNEL

Assoc Prof Dr Zary Shariman Yahaya (Principal Investigator)
Dr Manorenjitha Malar (Senior Research Officer)
Mr Adanan Che Rus (Senior Research Officer)
Mrs Nur Amirah binti Abdul Latif (Research Officer)
Mrs Noor Hazwani binti Bakaruddin (Research Officer)
Mr Muhammad Anwar Bin Ahmad Zubir (Social Research Officer)
Supporting staff of VCRU, USM to assist

4.0 MATERIALS AND METHODS

4.1 Test Samples

A minimum of 3 unit of Repellent sample was provided by the company.

Sample Name	Active ingredient
Invisible Natural Bad Bugs Repellent (DrBedBug)	Botanical Extract

4.2 Test Methods Laboratory Evaluation

The test was conducted following Malaysian Standards (MS 1497:2007). The following were the test chambers and methodologies to be used:

Experiments were conducted in screened, Aluminium cages measuring 60 x 60 x 60 cm with two 15 cm diameter circular openings fitted with cloth sleeves. A batch of 25 female sucrose-fed *Aedes aegypti* mosquitoes (aged 5 to 7 days old) were introduced into the cage.

The right arms of human volunteers were left untreated whilst the left arms were treated with the test sample. An amount of 0.5 g of test sample was applied. Application was left to dry before covering it with a rubber sleeve within 30 minutes after treatment. For each arm, a surface area of 24 cm² (3 cm x 8 cm) was exposed to mosquito landing/biting activities through an opening on the rubber sleeves.

Both hands (up to the wrists) were covered with thick rubber gloves to prevent from unwanted bites. The arms were exposed simultaneously for 5 minutes every 30 minutes and the number of mosquitoes landing/biting were recorded. The assessment period shall continue up to 4 hours post-application of the test sample. A fresh batch of mosquitoes were introduced to replace the exposed mosquitoes at each assessment period. The experiment was done in **triplicates**. All test was conducted at temperature of 26 °C ± 2 °C.

The effectiveness of a repellent product was assessed by determining the percentage reduction of mosquito biting/landing on treated arm when compared with the untreated arm.

$$\% \text{ reduction} = \frac{\text{No. mosq. on untreated arm} - \text{No. mosq. on treated arm}}{\text{No. mosq. on untreated hand}} \times 100\%$$

5.0 RESULTS

TABLE 1: The repellency effects (% Landing/biting reduction) of Invisible Natural Bad Bugs Repellent (DrBedBug) tested against *Aedes aegypti*

Time exposure after treatment	Invisible Natural	
	No of mosquito landed on untreated arm	No of mosquito landed on treated arm
0'30"hours	11.33±0.88	1.00±0.58
% Reduction	91.38±5.28	
1'00"hours	12.00±0.58	1.67±0.33
% Reduction	86.03±2.93	
1'30" hours	13.67±0.33	3.67±0.33
% Reduction	73.26±1.83	
2'00" hours	11.67±0.33	5.00±0.00
% Reduction	57.07±1.26	
2'30" hours	11.67±0.33	5.67±0.33
% Reduction	51.52±1.52	
3'00" hours	10.33±0.33	5.33±0.33
% Reduction	48.18±4.30	
3'30" hours	11.33±0.33	6.33±0.33
% Reduction	44.19±1.26	
4'00" hours	10.00±0.00	6.00±0.58
% Reduction	40.00±5.78	
TOTAL	92.00±1.53	34.67±1.45
% Reduction	62.35±0.98	

Table 1 showed repellency effect of test sample provided by **Vircast Medic Sdn. Bhd.** against *Aedes aegypti*. It was shown that **Invisible Natural Bad Bugs Repellent (DrBedBug)** provide good protection against mosquito landing/ biting up to 1'00" hours. At 1'30" hours, 2'00", 2'30", 3'00", 3'30" hours and 4'00" hours interval, it was found to show reduction in protection rate which is $73.26 \pm 1.83\%$, $57.07 \pm 1.26\%$, $51.52 \pm 1.52\%$, $48.18 \pm 4.30\%$, $44.19 \pm 1.26\%$ and $40.00 \pm 5.78\%$, respectively.

6.0 COMMENTS

The testing showed that Invisible Natural Bad Bugs Repellent (DrBedBug) provided by Vircast Medic Sdn. Bhd. have shown good protection against *Aedes aegypti* for 1'00".

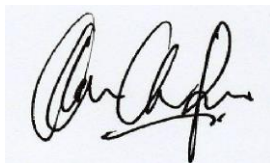
7.0 REFERENCES

MALAYSIAN STANDARD (MS 1497:2007). Household Insecticide Products – Personal mosquito repellent – Evaluation method for biological efficacy. (First Revision). ICS: 65.100.10, 71.100.99.

Note: The result of the test report related only to samples tested.

14 NOVEMBER 2022

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