

NAC 022/2019

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TEST REPORT

TITLE

EVALUATION OF SIRENIX TRAP AGAINST DENGUE VECTORS *Aedes aegypti* IN THE TROPICAL ENVIRONMENT.

TESTING FACILITIES:

VECTOR CONTROL RESEARCH UNIT
SCHOOL OF BIOLOGICAL SCIENCES
UNIVERSITI SAINS MALAYSIA
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DATE SAMPLE/S RECEIVED: 25 SEPTEMBER 2019

DATE TEST STARTED: 30 SEPTEMBER 2019

DATE TEST COMPLETED: 7 OCTOBER 2019

DATE OF THE TEST REPORT: 17 OCTOBER 2019

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1.0 TITLE

Evaluation of Sirenix Trap against dengue vectors *Aedes aegypti* in the tropical environment.

2.0 OBJECTIVES

To conduct semi-laboratory study of the efficacy of Sirenix Trap against *Aedes aegypti*.

3.0 RESEARCH PERSONNEL

Dr Hamdan Ahmad (Principal Investigator)
Professor Dr Zairi Jaal (Co-Investigator)
Mr Adanan Che Rus (Senior Research Officer)
Supporting staff of VCRU, USM to assist.

4.0 MATERIALS AND METHODS

4.1 Test Samples

A minimum of four units of Sirenix was provided by the company, Bentz jaz Singapore Pte Ltd. The specification of the Sirenix larvae trapper was showed in Annex 1.

4.2 Test Insects

The larvae stage of *Aedes aegypti* used in the trials are from well-established laboratory colonies at the Vector Control Research Unit, Universiti Sains Malaysia (VCRU susceptible strain) that were previously collected from Penang Island.

4.3 Test Methods

In the simulated study, a total of four units of Sirenix Trap were used to study its efficacy.

The study was conducted outside the laboratory environmental where the Sirenix Traps were place outside the Laboratory which is exposed to sunlight. A total of 2 Liters seasoned water was filled in each of the Sirenix Trap. One hundred laboratory culture mosquito larvae (**first instar**) of *Aedes aegypti* from well established laboratory colony were introduced into the Sirenix Trap. Larvae mortality was recorded for a maximum of 7 days post-treatment. The experiments were stop when all larvae were died. The larvae mortality will be recorded post-treatment at daily basis, while adult emergence will be observed for a maximum period of 7 days. The evaluation were terminated when all larva tested were killed.

All environmental and weather measures were recorded including temperature, relative humidity and weather (raining or sunny).

5.0 Results

The *Aedes aegypti* mosquitoes larva mortality after introduced into the Sirenix device for a maximum of seven days. A total of 100 *Aedes aegypti* larva (first instar) were used for the test and four replicates were conducted.

Cumulative Mortality Post-treatment (day)	Day 1	Day 2	Day 3	Day 4	Day 5
Mean \pm SE	18.25 \pm 0.85	53.75 \pm 2.95	83.75 \pm 1.25	93.75 \pm 1.11	100.00 \pm 0.00

The Sirenix device killed 100% of the larva of *Aedes aegypti* within five days after introduction of larva into the Sirenix device. Although some of the larva were observed to emerge to instar two on day 3, but the entire emerged 2nd instar larva been killed by the Sirenix at the day's 5 post-treatment.

The mean temperature and relative humidity recorded were 29.24 \pm 0.06 °C and 58.76 \pm 0.64 %, respectively. While the weather during the day throughout the trial period was sunny and this fulfilled the device (Sirenix) requirement on a minimum of six hours sunlight exposure, although during the night in some of the days recorded some raining night.

6.0 COMMENT

Sirenix effectively killed 100% of the larva of *Aedes aegypti* within five days.

As conclusion, Sirenix provided excellent killing activity against larva of *Aedes aegypti* mosquitoes and successfully prevent emergence of pupae or adult.

7.0 REFERENCES

- WHO. 1996. Report of the WHO Informal Consultation on the evaluation and testing of insecticides in WHO/HQ, Geneva, 7-11 October 1996. CTD/WHOPES/IC/96/1.
- WHO. 1998. Report of the WHO Informal Consultation on the guideline specifications for household insecticide products. CTD/WHOPES/IC/98.3

17 October 2019

Note: The results of the test report related only to test traps tested.

Prepared by:



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Approved by:



Dr. Hamdan bin Ahmad
Coordinator
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School of Biological Science
Universiti Sains Malaysia

-----**END OF REPORT**-----

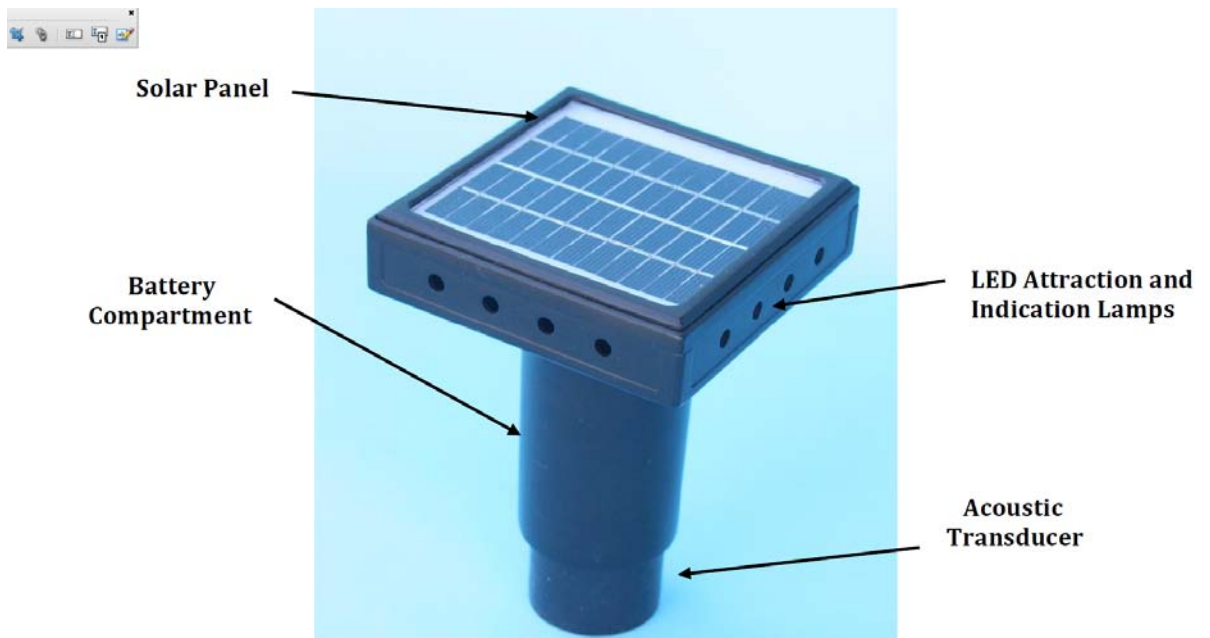
Annex:

Annex 1: Specification of Sirenix larvae trapper

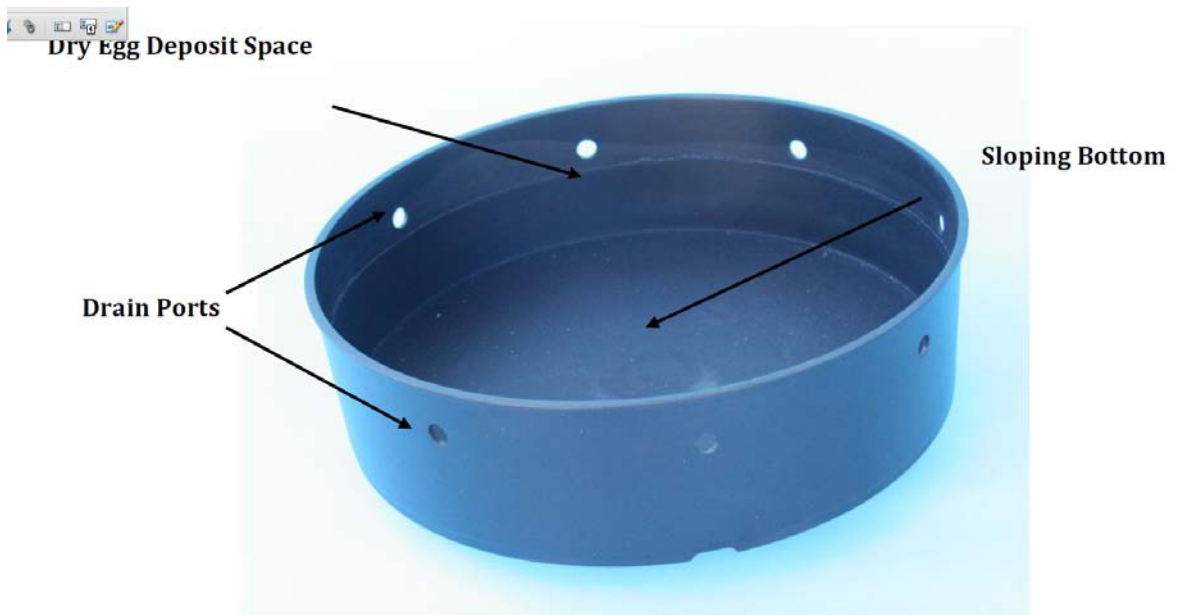
SPECIFICATION OF SIRENIX LARVAE TRAPPER

SIRENIX™ integrated system consists of three major components made of the highest quality and reliable materials to ensure long life. All plastics are UV stable. The solar panel is top quality enclosed in glass, not plastic which typically fades and reduces output in short order: The Solar panel will maintain its performance for many years.

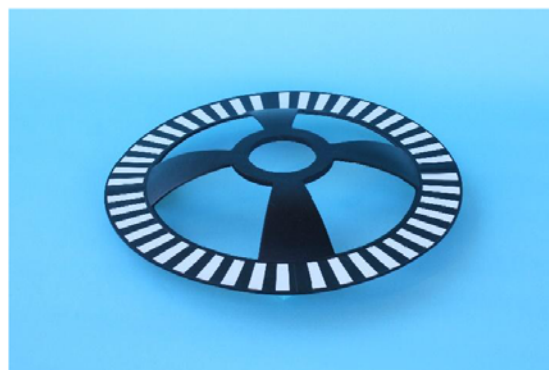
- 1. Integrated Acoustic Source (IAS)** – Waterproof self-contained system with Solar panel, Acoustic amplifier/controller, Sound transmitter, 9V LIMH battery, indicating and attractive lights. This component transmits the lethal acoustic energy into the water killing the larvae. The blue LED are an attractant to mosquitoes as well as serving a status indicator. It identifies normal system operations and will indicate if water needs to be manually added.



2. **Hatching Basin** – UV Stable plastic pan with side drain ports. This basin fills with water either from natural rain or manually by hand. The side drain ports provide a dry shady space above the water where some species of mosquito will lay their eggs. The bottom is slightly sloped to the center always allowing water to touch the acoustic transmitter.



3. **IAS Support and Shade cover** – UV Stable plastic pan with side drain ports and cover to support the Integrated Acoustic Source and provides shade and visual attractants for gravid female mosquitoes.



Annex 2: Raw data: Mortality of *Aids aegypti* larvae after introduce into Sirenix device.

Mortality Post-treatment (day)	Replicate 1	Replicate 2	Replicate 3	Replicate 4	Mean \pm SE
1	18	20	16	19	18.25 \pm 0.85
2	53	60	46	56	53.75 \pm 2.95
3	83	87	81	84	83.75 \pm 1.25
4	93	97	93	92	93.75 \pm 1.11
5	100	100	100	100	100.00 \pm 0.00
6	100	100	100	100	100.00 \pm 0.00
7	100	100	100	100	100.00 \pm 0.00
Total	100	100	100	100	100.00 \pm 0.00
Pupae emergence	0	0	0	0	0
Adult Emergence	0	0	0	0	0