

Review Article

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Mosquito Control, Killing Them Before They Hatch

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ABSTRACT

Mosquitoes are the most harmful insects who cause 2 million illnesses, kill 28 thousand people daily, most of them are in underdevelopment countries where a good part of the population is living without running water, people store water in large containers for their daily uses especially for food preparation, cooking, and drinking; there come mosquito habitats. People there are looking up to science for uncharm methods to kill those mosquito-to-be larvae and pupae that are already in their home. Proposed methods include introductions of oil, soap, toxin, or larvae eating fish contaminate their waters making them unfit for human consumption, they do not welcome. Because the insects are naturally air breathers, using minuscule snorkeling syphons, the experiments used CO₂ to suffocate them by bending a duct to redirect smog from small candles onto the water surface. As the result, they were all killed in minutes.

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Received: January 04, 2024; Accepted: January 11, 2024; Published: January 17, 2024

Keywords: Mosquitoes Malaria Dengue, West Nile Virus, Zika, Yellow Fever, Chikungunya

Introduction

It's estimated at 700 million illnesses the mosquitoes cause yearly [1]. If each patient comes with 3 other family members enduring more hardships, we are looking at 2.8 billion people, or one third of the entire human population are yearly suffering because of them. People get sick of mosquito borne disease by mean of their bites primary around their homes then their workplaces especially the children, thus, efforts to control them at peoples' houses should be the for front endeavors, we attack them at the places they cause the most harm.

The study aims to address the situations where people have their water container purposely placed at their house, their kitchen for people in rural areas. there They have tried desperate measures to kill them as apart of achieving clean water at least to drink so did us. It was our childhood labor job to whirlpool the large vases to kill them. It took us quite some time to kill only some, not all. Live larvae that were often left behind in the coconut shell bowl we just drank from.

One can easily kill thousands of every mosquito-to-be larva or pupa in a single habitat, but killings a thousand mosquitoes in the wild is an extremely hard job only if he/she can, we cannot. Years of experience taught us that a 20-liter habitat could easily house a thousand larvae, with 1:1 natural gender distribution 500 female mosquitoes will emerge or 1500-2000 are yet to come.

Mosquito larvae and pupae are not capable of extracting oxygen from water like fish they breathe air by floating head-down to have the mouth of their syphons or breathing tubes raised just above the water line like snorkels divers use to get air. They must come to the surface to breathe, for they can only hold their breath for

seconds [2].

CO₂ is a heavier than air vapor sinking to the surface to form a thickening layer as its volume grows. In nature the air contains 400-800ppm parts per million it becomes toxic by inhalation, CO₂ is also used as a humane agent for euthanasia [3,4].

Because their syphons are only a fraction of a millimeter above the water line, our objective is to introduce CO₂ in enough volume to form and maintain a few millimeters thin layer on the water surface. 1 gram of carbon in the fuel produces almost 2 liters of CO₂ at normal temperature, pressure (NTP), we need only several grams.

The working principle of the experiments is to dissipate the heat of smog and CO₂ from hot burning candles, for its cool air sink onto the larva habitat, a CO₂ layer formed as shown in Figure 1.



Figure 1: Candle smog harvesting

Equipment and Method

- The experiments used a 3" x 8' (7.5 cm x 2.4 m) (D x L) aluminum duct and 3 small cup candles.
- About 100 samples at various instars including pupae in a 2-liter larva habitat.
- They are set up as described in the above Figure 1.

Results

After 10 minutes, they all died.

The experiment was repeated 3 times with the same results.

As of the death of CO₂ suffocation, their bodies floated in sideways instead of their normally head-down for they can breathe, as shown in Figure 2.



Figure 2: Floating dead larvae and pupae

Discussions

In third world areas, during dengue and malaria infection period, health public departments assemble mosquito squad going through neighborhood and peoples house to spray killing mosquitoes but concentrating on killing their larvae and pupae. People don't want to have their water their house peppered with poisons. Perhaps it may do more harm than good.

For most field applications, we would recommend using a mid to large size adjustable fire wick oil lamp and have 1 or 2 wet towels on the duct to cool the smog. A dozen grams of fuel is about it.

The insects died in floating positions; they can be net scooped out to return the water quality in even better shape.

We had trial runs that utilized other CO₂ sources such as dry ices, chemical reaction of citric acid with baking soda or from pressurized tanks, they all worked as far as we could manage the releases to maintain the CO₂ layer for the periods.

On the market, dead larvae are offered for sale as fish food; it makes the point that it is profitable for others to raise, collect, package and marketing while people there can help themselves from getting sick and have the raw material for free at the same time, a win-win situation.

Conclusion

The end purpose of mosquito control is not to reduce their population but to lessen or at best to avoid chances, any chances of getting mosquito borne illnesses with some eventually lead to

deaths. People get ill mostly from mosquito bites in and around their homes or workplaces. With the success of the method and the wide market availability of the components, the method is ready for widespread adoptions; all the people there need is a little know-how to help themselves, they are ready, and we are ready at one larva, one mosquito, one bite at a time.

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