

## CONTROL OF VAMPIRE BASED DISEASES IN SLUM AREA SURROUNDED BY COOVAM RIVER AT CHENNAI

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### ABSTRACT

In the recent survey report of Chennai Corporation encountering twin problem of mosquito menace and mosquito borne disease like malaria and dengue. Between these public health issues, the problem of mosquito menace is realized more by the people of Chennai than the disease. The chief source for mosquito menace in Chennai is water ways and storm water drains (Kooavam). Nowadays the Mosquitoes are a big menace to humankind and these are present in every corner of the world. The mosquitoes are pestilent and it can spread diseases also. The best way to destroy mosquito is electronic killing using Swatter. It used to keep away from the use of toxic chemicals. The mosquito coils and liquids do not kill mosquito but they repel them only. When the chemical disappears from the atmosphere the mosquitoes will return back. The swatter we designed is meant for destroy the mosquito and not for repelling. Since each mosquito lays thousands of eggs, destroying a mosquito equals to destroying thousands of mosquitoes. Mosquitoes are Crepuscular (Twilight active- Evening and early morning) and they show mass migration in places where human beings are located. Based on survey reports most of the mosquito has feeble flying ability, so that they capable of flying only 10-20 meters distance and also up to a height of 20-25 meters. Mosquitoes usually fly above the ground level around 2-3 feet. That is why we get more mosquito bites in the legs. In our project initially we have a plan to build the swatter in each window and around stagnant water of our house. The swatter gets supply from battery which in turn charged with the help of solar panel or it gets supply from Main. The microcontroller will decide when to switch on / off the swatter and also it monitors the charge and discharge level of battery and also it close the window automatically during rainy time. Also we have the plan to implement the same in Kooavam River {Chennai} just by building fence at the side of river at a height of about 4 meter.

### 1. INTRODUCTION

#### A. The Biological Analysis of Mosquitoes

The Mosquitoes were annoying and it can spread diseases. The best way to destroy mosquito is Swatter method (electric current). It eliminates the use of toxic chemicals. The mosquito liquids and coils do not kill mosquito but they repel them only. The Mosquitoes will return back when the chemical disappears from the atmosphere. The swatter is also called as Mosquito racket and is used for killing the mosquito and not for repelling. Since each mosquito lays thousands of eggs, destroying a single mosquito equals destroying thousands of mosquitoes.

1. *Mosquito Biology:* The mosquitoes and mosquito bites are annoying. The irritant mosquitoes disturb people around homes or in public places and recreational areas and everywhere. They reduce property values, adversely affect tourism developments and negatively impact on livestock production. The mosquitoes dispatches deadly diseases like Dengue fever, Malaria fever, Chikungunya, Filariasis, Encephalomyelitis etc. Swarming in Mosquito

Mosquitoes are Twilight active- Evening and early morning (Crepuscular) and they show mass migration in places where human beings are located. Mosquito can fly only 10-20 m distance and up to a height of 20-25 m. The mosquitoes can fly above the ground level around 2-3 feet. That is the major reason for getting more mosquito bites on the legs. Mosquitoes prefer legs because the veins in the legs are located just below the skin. The mosquitoes biting

majority peoples who are the members of the common public. That's why mosquitoes resides in our own home. Mosquitoes cannot travel to long distance for biting

#### a. Ultrasound detection

Male mosquito produces ultrasound vibrations to attract its females [6]. After mating, female mosquito detects the ultrasound from males and avoids its presence. The Ultrasound mosquito repellent produces 22-38 kHz ultrasound to simulate the sound of male mosquito. The device act as its male mosquito and the female mosquitoes avoids its presence.

#### 2. Human detection

Mosquitoes have different methods for detecting the hosts and different types of the mosquitoes were react to different stimuli. Many mosquitoes were active at dawn and dusk, but there are also day biting mosquitoes. There are so many factors that attract mosquitoes towards human being.

#### a. Body Temperature

The body temperature sensing depends on the type of mosquito. Many of the mosquitoes were attracted to the slightly cooler temperatures of the body.

#### b. Carbon Dioxide

Carbon dioxide content in the body and in the closed room also attracts mosquitoes.

#### c. Moisture

Mosquitoes were attracted by perspiration because of the chemicals it contains harmful chemicals, and also because it increases the humidity around your body. Aquarium, Interior plants etc attracts more mosquitoes.

d. Lactic Acid

Lactic acid content of the body is also an attractant. Lactic acid content in the blood increases after eating the salty and high potassium food materials and also after exercise.

e. *Perfumes and Flowers*

Perfumes, cosmetics, fragrant cloths, floral decorations etc attract mosquitoes.

f. *Dark Clothing*

Dark cloths attract mosquitoes because they can easily locate the host from surroundings. They have feeble vision. The Mosquitoes rest on removed clothes due to the presence of the body smells and it will think that human is there.

g. *Mosquito bite*

Mosquitoes have chemo sensors which detects the humans or any other animal by the odour, heat etc released by the body and also the carbon dioxide exhaled by humans and other animals. Mosquito bites were caused only by the bite of a female mosquito. The female mosquito feeds our blood by its mouth part. While sucking our blood, mosquito deposits some saliva into the skin of the host. The saliva contains anticoagulant proteins that remain in our body and react with the body chemicals, results in itching and bump. Both Male and Female Mosquito are Plant juice feeders but the female mosquito in order to get blood protein for maturation of their eggs, it bites human beings. On the first day of emerging from the pupa, female mosquitos do not bite, on the second day it mates and starts feeding human blood. After two or three days the female mosquitos lays thousands of their eggs in water and die off.

h. *Mosquito Life Cycle*

The mosquito life cycle varies between species to species. It also varies based on environmental conditions such as temperature and moisture. But the life cycle of all the mosquitoes is comprised of the egg, larval, pupal and adult stages. Male mosquitoes feed on plant nectar but the females extract the blood of hosts, to develop and nourish eggs. Most mosquitoes lay eggs directly into water. Very few lay their eggs near the bodies of water. The following figure demonstrates the life cycle of mosquito.

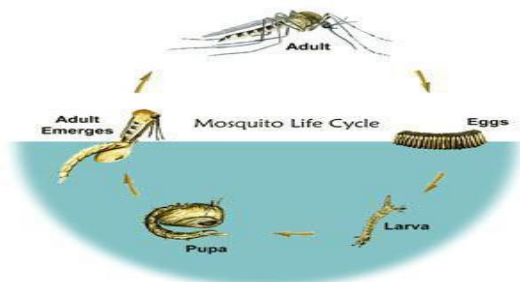


Fig. 1. Mosquito lifecycle

Within 24 to 48 hours the eggs will hatch into larvae. Very soon the larvae grow approximately 5 mm in length. Most of the larvae breathe through the air tubes. Larger larvae will float above the surface of the

infested waters. Within 7 to 10 days, larvae enter pupal stage. It also visible upon the surface of a breeding site. After the mosquito is fully developed, it emerges as an adult. Then the new adult mosquito stands upon the water and dries its wings for flight. Adult female mosquitoes are capable of flying for miles if necessary and can lay 100 eggs at a time. Larvae and pupae cannot survive without the water. If a water source evaporates the larvae and pupae will die.

3. *The trouble with mosquitoes*

Mosquitoes have been living from the Jurassic period. It is about 210 million years old. Most people have minor allergic reactions to the saliva from mosquito bites, causing the area around the bite to itch and swell. Malaria is caused by the parasite that lives in mosquitoes. The parasite gets into saliva of mosquito and is passed on when the mosquito bites someone. West Nile and other viruses are also passed in the same manner. West Nile virus came to the U.S. in 1999. Scientists first identified the virus in a feverish woman in Uganda in 1937. The virus was first appeared in the United States in 1999 with an epidemic in New York.

Mosquitoes will not transmit HIV. The HIV virus will get digested in the mosquito stomachs and so the virus does not replicate, therefore it's broken down without being passed on. Mosquitoes are considered to be the deadliest "animal" in the world. The female Anopheles mosquito transmits malaria, which kills more than one million people in Africa every year. The king Alexander also, believed to have died of malaria in 323 B.C.

II. *LITERATURE SURVEY*

B. *Methods to Prevent Mosquito*

1. *Natural Method*

a. *Neem oil*

Mixing neem oil with coconut oil in a 1:1 ratio is an effective way to keep the mosquitoes at bay[9]. It is a potent antibacterial, anti-fungal, antiviral and anti-protozoa agent, neem lends the skin a particular smell that wards off mosquitoes, rubbing the mixed coconut oil and neem oil in a body will protect mosquito bites for at least eight hours.

b. *Eucalyptus and lemon oil*

The lemon oil and eucalyptus oil has both antiseptic and insect-repellent properties when applied to the skin. It is natural and does not produce ill effects of chemical mosquito repellents.

c. *Camphor*

Camphor which is made from the extract of a tree, has been found to have the longest mosquito repellent

activity when compared to others . Light the camphor in a room and close all the doors and windows. Leave it this way for about fifteen to twenty minutes and the room will be mosquito free.

*d. Tulsi*

Tulsi was extremely powerful in killing mosquito larvae . Planting a tulsi shrub near the window will keep mosquitoes away. This plant has properties that do not allow mosquitoes to breed and will prevent them from entering your house.

*e. Garlic*

The strong and pungent odour of garlic will prevent mosquito bites and even prevents them from entering your home . Crush up a garlic with water and boil it and use the boil water to spray around the room you want to keep mosquito free.

*f. Tea tree oil*

The smell and its antifungal and antibacterial properties of tea tree oil help prevent mosquitoes from biting you and drive them away. To use this remedy you could either rub some tea tree oil on our skin or add a few drops of it to a vaporizer. The scent of tea tree oil permeates the air keeping mosquitoes at bay.

*g. Mint*

Mint leaves used it in a vaporizer to help fill the room with the scent of mint, apply the oil on our body or plant the shrub outside your room's window. Alternatively mix a bit of mint-flavoured mouthwash with water and spray it around home.

*h. Citronella*

Citronella oil extracted from citronella grass. This oil prevent mosquito bites extremely efficiently. We can use this extract instead of chemical agents. Infuse this extract in a candle or use it in a vaporizer to help us stay mosquito bite free.

**2. Artificial Method**

In artificial method coils and repellents uses the toxic chemicals such as DEED in repellents and formaldehyde in mosquito coils, a colourless, flammable and strong smelling gas, is said to affect the nose. Inhaling it could cause throat discomfort, watery eyes, coughing, nausea, wheezing and skin irritation. Also, it can cause nasal or sinus cancer and even leukaemia, experts say. In electrical methods currently available the people has to find and kill the vectors using bats and so on.

**III. SYSTEM DESIGN**

**A. System Architecture of Proposed Method**

Mosquito is the major root cause of transmission of many diseases. There are so many projects had done to get rid of mosquito but the problem is the population of mosquito is not under control. The system architecture and Circuit diagram are follows in Figs.

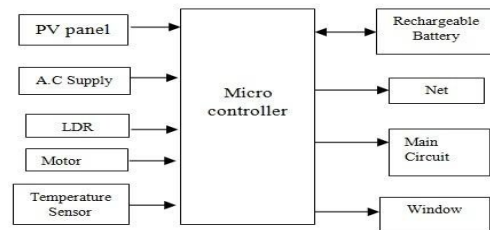


Fig. 2. System Architecture

**B. Circuit Diagram of Proposed Method**

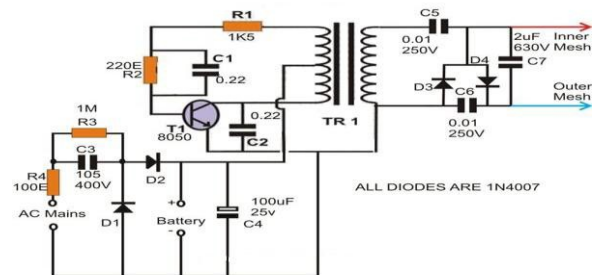


Fig. 3. Circuit Diagram

**C. Working Principle**

There are two input sources one is PV panel another one is AC panel (ie) Main panel. The outputs have given as input to the micro controller, based on the sensor information the micro controller collects the input from PV panel when sunlight is sufficient otherwise it gets the supply from the AC (ie) main panel. The AA size rechargeable battery of 1.2 V to 1.5V gets charged based upon the micro controllers information that weather it collect the supply from AC panel or PV panel. The system has two modes for it operation , in a manual mode the user can enable the circuit to be work against vectors otherwise the LDR sensor senses the light and gives information to the micro controller then micro controller has to decide whether the main circuit has to be switched on or not based upon the climatic conditions .

The temperature and Humidity sensor senses the rainfall climate conditions which ensures the micro controller to be switch off the circuit on the raining situations. The main circuit gets the supply from the battery which enables the step up transformer to rises the voltage to 2500 volts on the swatter. Along with the swatter an artificial attractant has placed which brings the vectors to the swatter. The direct contact of vector on swatter kills the insects.

**IV RESULTS AND DISCUSSION**

The vector control system based on the micro controller along with rechargeable battery which designed to have low discharge level and high storage capacity also have two way rechargeable methods through PV panel and AC panel. The electric swatter gets the 2500 volts without any fluctuation from the step up transformer. For the security purpose it also enabled with the protective shield .which act as immense protection from electric voltage for both human and

other valuable things. The attractant (octenal) brings the mosquito to the swatter which is not harmful to the human which can be lasts for 30 days .As future work

Initially we have a plan to install the system in Koovam river Chennai

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