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## Control of mosquito population: A pilot study

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### Abstract

Mosquitoes are an important vector for several arthropod borne diseases like dengue, chikungunya, Japanese encephalitis, malaria & filaria which have become common in tropical countries like India with a variable rate of morbidity and mortality.

The population of these mosquitoes have increased due to rapid urbanization and inadequate control measures leading to resurgence of the diseases. Various larvicide methods have been tried but without appreciable sustained results. The present study aims to evaluate the efficacy of an adult mosquito population control by use of a "swat" which is ecofriendly and economical. The results of the study is encouraging and can be tried at the national level.

**Keywords:** Mosquito, Infections, Control, Swat.

### 1. Introduction

Mosquitos of different species constitute the important vector for a variety of infections. Parasitic diseases like Malaria, Filaria & Viral infections like Dengue, Japanese encephalitis are some of the common infections transmitted by the bite of mosquitoes. In the absence of an effective vaccine for Malaria, Dengue and Chikungunya, prevention of these severe diseases is posing a great problem. The geo climatic conditions in India are conducive for the transmission of Vector borne diseases [1]. The strategies currently advocated and practiced by various countries in controlling the population of mosquito by use of larvicides, insecticides and repellents etc. have been only partially successful in achieving the goal.

### 2. Material and Methods

In recent years the adult mosquito killing electric/ battery operated bat (Swat) have emerged as one of the useful products to control the adult mosquito population. To check the efficacy of this method we included a group of 10 independent alternate houses situated in a colony of a semi urban area of Puducherry. The adult members of the family were briefed about the pilot study. All the households were provided with a swat and explained its usage. Each of them were asked to use the swat for 30 minutes during the peak hour of mosquito swarming i.e. between 6.00pm-6.30 pm, simultaneously sitting in the front hall keeping the doors and windows open and count the number of mosquitoes killed. This was repeated for three consecutive days during the last week of October 2015. The number of mosquitoes killed per day from each of the houses was gathered on three successive days and the average per house was calculated.

### 3. Results

The average number of mosquitoes killed per house per day in 30 minutes was 78. The count was based on visual examination of the dead mosquitoes trapped or dropping dead. None of the participants reported any adverse effect.

### 4. Discussion

Dengue is being increasingly reported from all over India in the past one decade with outbreaks occurring on and off. There has been increased morbidity due to dengue hemorrhagic fever (DHF) and Dengue shock syndrome (DSS) Chikungunya has also been reported from most parts of the community in the past few years leading to crippling joint pain,

which recur or persist for a year or more. Malaria is a well-known parasitic disease still rampant in the developing and under developed countries including India with severe forms of disease both due to *P. falciparum* and *P. vivax* being increasingly reported with increased morbidity and mortality. There have been reports of increasing drug resistance in malaria to all the available drugs thus leading to therapeutic failure.

Absence of specific antiviral agents and increasing necessity for platelet transfusion, which is not easily available for patients with DHF and DSS has made the management of these cases a challenging task for the physician. Similar is the case with Chikungunya where there are no vaccines or specific antiviral drug to mitigate the suffering. The other methods of vector control like prevention of breeding of mosquitoes by preventing stagnation of water are practically difficult tasks. The population of mosquitoes has been increasing drastically all over the country including urban and rural areas in the past few years and nights have become a real nightmare for the people forcing them to stay indoors with all windows and doors closed all through the night, even during hot months. The commercial products used by the people like mosquito coils, liquidator, mats, creams, sprays have failed due to development of resistance to these and other insecticides [2, 3, 4, 5]. On the other hand some of these products cause allergic symptoms like irritation of eye, sneezing, wheezing in susceptible population. The safety of these products for human on prolonged use has not been conclusively established. The idea of sterilizing the male mosquitoes requires huge expenditure with no assured result. The authors feel that the only bio safe, economical, ecofriendly and user friendly strategies should be used in control of the mosquito populations.

The authors feel that if swats are used by every house in a community every day for at least half an hour a day for about 12–24 weeks the populations of the mosquitoes can be drastically reduced, thus bringing down the incidence of the disease caused by mosquitoes. The recurring expenditure for a battery cell or recharging would not exceed more than one rupee per day while most of the repellants cost more than double of this amount. The biggest advantage is instant death of adult mosquito, no side effects, ecofriendly, bio-safe and user friendly. The Government can provide the swat to poor at subsidized rate and encourage their use by media campaign in the form of video clipping.

The services of the student volunteers, NGOS, NSS students, traffic police retired persons, security guards of all establishments can all be roped in to participate in a programme like “Operation Mosquito Eradication” day which can be Saturday and/or Sunday as “Mosquito free day” and requested to kill the mosquitoes in their area with the swat during the peak hours of mosquito menace i.e dusk/dawn for about an hour a day. The results can be judged by estimating the vector population by scientific studies every fortnight and through feedback from the community.

## 5. Conclusion

Use of a simple, inexpensive, user friendly, ecofriendly instrument like a mosquito “swat” is useful in controlling the population of the adult mosquitoes and thus resulting in reduction in their population due to reduction in the number of fertile male & female mosquitoes. The reduced population of adult mosquitoes reduces the chances of diseases

transmitted through the bite of adult mosquitoes. The method will be a useful supplement to the existing control measures.



Fig 1: Showing mosquitoes



Fig 2: Showing killed mosquitoes.

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