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A novel environmental friendly mosquito control strategy without chemical use

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Abstract

The emergence and rapid spread of environmental pollution and insecticide resistance undermine the current mosquito control strategies. There is a global consent that new tactics are needed to suppress mosquito densities especially in areas of high insecticide resistance. The present opinion introduces a completely novel idea to attract mosquitoes to lay eggs in man-made breeding sites where they will be monitored at regular interval and developing stages will be destroyed before adult emergence. This may prove a safest mosquito control measure and will have a huge impact on our strategies for mosquito management without causing environmental pollution.

Keywords: mosquito larvae, mosquito control, larval density.

1. Introduction

Mosquito ranks number one among insects responsible for human diseases^[1]. The problems of mosquito transmitted diseases are quite severe worldwide resulted in high morbidity and mortality^[2]. Efforts have been made to control them. Initially when modern pesticides were first introduced for control of public health pests in the middle of 20th century, some thought the perfect control had been discovered. Unfortunately, despite some early success pesticides ultimately proved to be the less-than perfect solution for long term mosquito control. Control measures could be aimed at different stages of mosquitos' life cycle, using biological, physical and chemical control^[3]. An effective and efficient mosquito control program the integrated mosquito management programme (IMM) was introduced that blends the use of both chemical and non-chemical control measures the essence of IMM. It starts from identification of the species of mosquito causing the problem. One or more measures could be selected from the biological, environmental and chemical categories for controlling the target species^[4]. The present mosquito control strategy aims to attract mosquito to lay eggs in controlled breeding sites and eliminating the developing stages before adult emergence without any chemical use.

2. Material and methods

When planning and implementing program for control of mosquito a number of key factors should be considered. To decide where to setup mosquito breeding stations, a well-designed sampling and surveillance program needs to be carried out to know what is going on with mosquitoes in a particular area. Knowing what species of mosquitoes are active provides clues as to where breeding is occurring and whether public health is threatened. Besides this the site for breeding stations will be selected where water supply is regular and proper monitoring is possible. The developing stages of mosquito life cycle particularly larval stage will be filtered out and destroyed at a regular interval of 4-5 days. This may help in virtually eliminating the seed population in that area.

2.1 Requirements for building mosquito breeding stations

Breeding sites needs be selected on the basis of disease status and adult mosquito density in urban and semi-urban areas. The breeding devices should be built according to breeding habits of common vector species of mosquito prevailing in that area. The structures should be properly engineered for filling and filtering out of water (to remove larvae every 4th or 5th day) and again refilling which needs proper water supply connections and drainage. Maintaining 5 day week operations and collecting the larval stages at 5th day. Weekly larval density records will be maintained species wise.

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2.2 Mosquito security and safety measures: Training needs to be imparted for safety and security to handling of mosquito breeding sites and potential hazards of escape.

3. Results and Discussion

The present mosquito control strategy plans to attract mosquitoes to lay eggs, where they can be monitored and destroyed at larval stages without any chemical use. This will be equally effective in suppressing mosquito population in areas of high insecticide resistance. The weekly record of larval density may predict the nature and extent of mosquito problem in the area and also evaluate effectiveness of control operation. Since mosquitoes are not static; they move around and change the breeding sites every now and then ^[5]. When mosquitoes will find breeding sites of their choice in the area of their flight range (1 to 2 Km) a large proportion will breed there. To know what attracts mosquitoes to locate the breeding sites and how they find even a small collection of water will be of great help in designing the breeding sites. Hence, further research needs to be focused on breeding strategies of mosquitoes.

4. Conclusion: The present mosquito control hypothesis to attract mosquitoes to lay eggs in man-made breeding sites where they can be easily monitored and controlled will provide a environment friendly solution to eliminate mosquitoes in an area. Understanding the choice of oviposition sites and dispersal behaviour is important for the design of successful breeding stations.

5. References

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