

Evaluation of “MozziQuit” Mosquito Trap Device in the Control of Mosquitoes and other Nematoceran Insects benefiting Increase in Milk Yield and Weight of Bovines

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Abstract

All warm blooded vertebrates are affected. In large populations Mosquitoes cause irritation and extensive blood loss to livestock resulting in anemia, reduced productivity of milk and sometimes even death. Mosquitoes are a great nuisance and their bites do cause painful reactions making cows panic. They also play an important role as intermediate hosts and as vectors in several important parasitic and viral diseases of domestic animals and man viz., filariasis, Canine heart worm disease, Malaria, dengue, chikungunya, equine viral encephalitis etc. The Author and the Managing Director of Leowin Solutions Pvt. Ltd. is the Innovator of “MozziQuit” mosquito trap device priced Rs. 1,800/- per unit inclusive of 18% GST which attracts, traps and kills female mosquitoes every day in large numbers at lowest operating cost of less than 10 paise per day without use of any chemicals or consumables or emission of any UV Radiation very safe for use in cow sheds. “MozziQuit” device was evaluated to find the possibility of its use for providing relief to cows and animals in live farms. In this study reveals relief to workers in cow shed from mosquito bites besides increase in Milk Yield as well as increase in Weight of Bovines after using “MozziQuit” in cow shed as the cows get maximum relief by trapping and killing of biting mosquitoes by “MozziQuit” device every day.

Keywords: Milk Yield • Cows • Animal farms • MozziQuit • Leowin • Mosquito trap • Mosquito • Malaria • Dengue • Zika virus • Filaria • Chikungunya • Yellow fever • Japanese encephalitis • Mosquito menace • Mosquito bites • Mosquito free world

Introduction

Mosquitoes are of major Veterinary and Medical importance due to their role as Vector for transmission of various parasitic, bacterial and viral diseases. Mosquitoes are distributed throughout the world. They are found at altitudes of over 4700 m as well as in mines 1250 m below sea level. Besides a worldwide distribution they are in general predominantly tropical pest. Mosquitoes usually travel a few hundred meters from their emergence sites. Generally, it is assumed that they do not fly further than 2km, but have been recorded to be dispersed 100 km or more, through wind. Mosquitoes feed on fruit juices and sugar water and male Mosquitoes normally exist on such food, but the females are blood suckers and require a meal of blood in order to lay eggs. The females seem to be attracted by the warmth radiating from the skin of their host either people or animals. They are active at night and are attracted mainly by carbon dioxide emitted by their host, while during the day they hide in areas of darkness, behind hanged cloth or lofts or shoe racks etc [1].

The integrated pest management plays an important role in controlling larval and adult habitats. Management mainly involves altering water bodies in order to reduce sources for larval development and egg laying. Biological control can be accomplished with the assistance of mosquito fish *Gambusia affinis* which feed on mosquito larvae but these methods have very less impact in Control of Mosquito population. Chemical control by use of insecticides is mostly employed but development of resistance

and environmental pollution are a major issues of concern. Secondly, the application of larvicides must be repeated periodically during the breeding season, it is costly and requires personnel for application, supervision and also for evaluation. Cow owners use chemical based mosquito repellent coils and also burn coconut shells to spread smoke in cow shed to chase mosquitoes [2]. In fact, Cows are more sensitive than people and they are in tied position inside cow shed as a result cow's kidney and liver get affected leading them to die earlier than their actual life span due to slow poison from chemical repellents and from the harmful smoke emitted by burning coconut shells. Hence, alternative methods to Control Mosquitoes like use of trapping and killing device like “MozziQuit” is very much needed. In present study patented “MozziQuit” mosquito trap device developed by M/s Leowin Solutions Private Limited, Mangalore, Karnataka, India was evaluated on the effective performance of trapping of mosquito vectors in cow sheds, poultry farms and in livestock farms as well as the various benefits of using “MozziQuit” device.

Techniques to be adopted for the investigation in brief

“MozziQuit” traps will be placed in different cow sheds and in few livestock farms.

- “MozziQuit” traps will be monitored on daily basis.
- The efficacy of the “MozziQuit” trap in mosquito and fly control will be evaluated.

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- Milk Yield and Weight of Cows to be monitored to check the difference post using “MozziQuit” in cow sheds.

Background and status of the problem as related to the proposed study

Mosquitoes and Nematoceran Insects are very difficult to control in spite of a number of available methods being implemented, such as various insecticides, barriers and traps. Therefore novel approaches are highly essential. Mosquitoes are everywhere. Female Mosquitoes bite people, animals and birds everyday again and again for blood meal required for their breeding [3]. Female Mosquitoes lay 300 to 1000 eggs during their life span of 30 to 100 days depending upon the species as a result mosquito population multiply quickly in multi folds. Sir Ronald Ross, an Indian born British National was Awarded Nobel Prize in 1902 for his discovery that Malaria Parasite is been transmitted by Mosquitoes. Since then Governments of all the countries with the assistance from WHO and World Bank are spending millions of amount every year for eradication of Mosquitoes under National Vector Borne Disease Control Programme besides conducting Malaria Awareness Programme. In spite of this initiative since 118 years, as of date still Mosquito population is increasing every year. According to WHO Report about 3.4 billion people – Half of the World's Population – are at risk of malaria. In 2012, there were about 207 million malaria cases and an estimated 627 000 malaria deaths and In 2013, 97 countries had ongoing malaria transmission. The incidence of dengue has grown dramatically around the world in recent decades. Over 2.5 billion people – over 40% of the world's population – are now at risk from dengue. WHO currently estimates there may be 50–100 million dengue infections worldwide every year according to report of World Health Organization [4].

Materials and Methods

Food Grade Powder Additives are added in the raw material of Polypropylene Plastic raw material while producing few of the plastic casing parts of “MozziQuit” device in Injection Molding Machine. Food Grade Powder Additives get dispersed all around within the said plastic parts by spreading everywhere 100% uniformly which remain forever intact in the said plastic parts beyond even 25 years. The light installed inside “MozziQuit” device in invisible mode without emitting any UV Radiation from the device releases luring effect with the combination of Food Grade Powder Additives dispersed everywhere in the said plastic casing parts. The Electronic Circuit Board (PCB) installed inside “MozziQuit” device to convert AC power to DC power generates required temperature [5]. Female Mosquitoes originally from the nearest external breeding locations enter inside houses/rooms and cow sheds mostly between 5 pm to 7 pm by detecting the smell of Carbon Dioxide exhaled by their hosts i.e. people and cows to extract blood required for their breeding process get attracted to “MozziQuit” device by the luring effect and the temperature emitted by “MozziQuit” device and start flying all around the openings particularly the trapping zone of the “MozziQuit” device.

The fan installed inside “MozziQuit” device forcibly sucks/vacuum all Mosquitoes which fly around the trapping zone to enter into the “MozziQuit” device making them to pass forcibly through the Perforated plate having holes slightly bigger than size of mosquitoes provided above the removable collection container. All trapped mosquitoes get collected in the removable collection container partially injured while passing through the perforated holes which die subsequently in some time. “MozziQuit” was kept at a height between 2 to 4 feet height from ground level in cattle, poultry, piggery farms and human dwellings at various institutions of Karnataka Veterinary Animal & Fisheries Sciences University. When this device was switched on most of the lights were switched off so that all the Mosquitoes present in the farms were attracted to “MozziQuit”. The “MozziQuit” was kept on from evening 6 pm to next day morning till 6 am. The Mosquitoes which were attracted, killed and collected in the container were counted on daily basis to evaluate the trapping efficiency of “MozziQuit” in control of Mosquitoes and other Nematoceran Insects [6].

Results and Discussion

The attracting, trapping and killing efficiency of “MozziQuit” was assessed during the period of May 2014 to October 2014.

- During this period of study, a number of biting insects were attracted, trapped and killed by this device

- A large number of Mosquitoes were attracted, trapped and killed along with the other harmful flies like Psychodida, moths, midges and Culiocoids

- Among Mosquitoes, maximum number of Culex species were attracted and killed followed by Aedes and Anopheles species which were found in the vicinity

- Maximum number of Mosquitoes were attracted, trapped and killed during the months of May and June. When the Mosquito population was high

- “MozziQuit”, an electrical device was found to be very effective in attracting, trapping and killing the maximum number of Mosquitoes in livestock farms. This indicates that all the farm animals and poultry birds are devoid of annoyance caused by the Mosquitoes and as Mosquito Population reduces there are less chances of transmission of other parasitic and viral diseases to animals and people. “MozziQuit” indirectly helps to increase milk yield in bovines and weight of cows as well as birds in poultry because of proper feeding, sleep and no nuisance or irritability or waste of energy to chase biting mosquitoes.

- “MozziQuit” device is cost effective and eco-friendly, does not involve personnel for monitoring or supervision and also for evaluation. Daily operating cost claimed by the manufacturer is said to be at very lower level equivalent to 15 Watts for MQ-MAX and 3 Watts for MQ-MINI only for electricity consumption.

- “MozziQuit” device attracts, traps and kills mosquitoes in large numbers every day at lowest operating cost of less than 10 paisa per day without use of any chemicals or liquids or refills or consumables or smell or smoke or ash or emission of any UV Radiation and very safe to use in cow sheds, animal live stock farms, poultry and in houses [7].

- More number of mosquitoes were attracted and trapped in “MozziQuit” device during the month of May and June compared to July and August. This variation could be probably due to the change in the environmental temperature. In later months, there was enough rain in Karnataka State where this device was assessed when the environmental temperature was reduced.

- Author/Innovator claims to have already demonstrated trapping of more than 100 million (10crore) mosquitoes by One “MozziQuit” mosquito trap device in 3 months period installed in the cow shed having 17 cows belong to near Mangalore International Airport in Mangalore. Number of 100 million (10 crore) mosquitoes were measured by checking the weight of counted 2000 dead mosquitoes in jeweler's weighing scale and by seeing the weight of dead mosquitoes filled in 10 PET JARS collected in 3 months by the cow owner. Dead mosquitoes in PET Jars do not rot instead they dry inside PET Jars.

- This trap named “MozziQuit” can be used for effective control of mosquitoes and related insects in all farms, cow sheds, residential areas and institutions with no side effects and economically viable as well with increase in production levels from farm animals [8]. Presently available mosquito repellents in the market made out of chemicals do not kill mosquitoes. Repelled mosquitoes lay 300 to 1000 eggs at their external breeding location and multiply into multi folds making it difficult to control mosquito population. It is possible to reduce mosquito population by use of “MozziQuit” Mosquito Trap device as it eliminates further multiplication of mosquitoes by attracting, trapping and killing of female mosquitoes. (Figures 1-3).



Figure 1. MozziQuit MQ-MAX in Cow Shed.



Figure 2. Trapped mosquitoes.



Figure 3. Trapped mosquitoes.

Conclusion and Recommendation

30% of India's Agricultural GDP is from Dairy Industry. Increase in Milk Yield by using "MozziQuit" device in cow sheds will enable Women to earn more daily income who mostly work in cow sheds at the bottom of pyramid level. Increase in Milk Yield will also enable all Milk Collection Unions as well as all Dairies to earn more income. Increase in Milk Yield as well as Increase in Weight of Cows will also enable to improve the GDP of every Nation. Malaria, Dengue, Chikungunya, Lymphatic filariasis and Japanese encephalitis are the important mosquito borne diseases prevalent in India

and pose an enormous burden to the public health system. *Anopheles stephensi* is the vector for urban malaria, *Culex quinquefasciatus* for lymphatic filariasis, *Culex tritaeniorhynchus* for Japanese Encephalitis and *Aedes aegypti* and *Aedes albopictus* for ZIKA Virus/dengue/chikungunya. A higher number of mosquitoes and vector mosquitoes in "MozziQuit" traps were observed in the present study, recommending efficiency of this MozziQuit trap for use in houses, cow sheds, in animal farms, poultry farms, in cars, in volvo buses, aircrafts and at external mosquito breeding locations. "MozziQuit" is a proven device to eliminate further multiplication of mosquito population/offsprings by attracting, trapping and killing of female mosquitoes in houses/cow sheds/external locations before they could lay thousands of eggs and multiply at their external breeding locations to enable eradication of all mosquito borne diseases in short span of time by implementing use of "MozziQuit" in every house, cow shed, poultry and at mosquito breeding locations under NationalIP programmes in all 91 malaria infected countries already identified by World Health Organisation as well as through Ministry of Agriculture, Animal Husbandry and Ministry of Tourism. Author is confident of his MISSION of Making India and the entire World Free of Mosquito Menace in short span of time.

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