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HERBAL MOSQUITO REPELLENT CANDLES: NANOTECHNOLOGICALLY PREPARED PRODUCT USEFUL FOR ECO-FRIENDLY CONTROL OF MOSQUITOES

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ABSTRACT:
Nanotechnology is rapidly growing branch of research as it has great relevance in multidisciplinary science. Mosquitoes are common vectors transmitting malaria, dengue, and chikungunya like diseases in human worldwide. Anopheles species are the most important species as they are capable vector for malaria parasites. Near about 3.3 billion people, nearly half of the world's population is at risk of malaria and dengue. In 2010, there were about 216 million malaria cases found in record of WHO. Dengue disease reported in the Hawaiian_Islands during 2015, 190 reported cases infected by dengue virus (DENV). Chemical mosquito repellents has a remarkable safety profile, but it contains poisonous parathyroid chemical which is toxic to human especially children. It causes damage to the nervous system, rashes on skin, swelling and eye irritations. It is mostly toxic to the children. Present paper focus on innovation of herbal mosquito repellent candles prepared nanotechnologically from locally available herbal plants, which has eco-friendly profile.

KEYWORDS: *Herbal plants, nanotechnology, mosquito candles, malaria, dengue, eco-friendly.*

INTRODUCTION

Alarming increase in the range of mosquito population is mainly because of unhygienic environment, increased slum areas, unplanned urbanization, deforestation, industrialized farming and stagnant water. Number of natural and chemical mosquito repellents was studied in many research papers and reviews Kim JK et al. (2005), Nerio LS et al (2010), Patel E.K et. al (2012).It was predictade that, use of mosquito repellent create health hazard problems such as these are toxic to the skin causing rashes, brain swelling in children, eye irritation, anaphylactic shock, and low blood pressure Patil S, Naik R et al. (2012). Many people dislike the odor of mosquito repellent which causes vomiting in women and children. Toxic element Pallethrin and Allethrin used in chemical mosquito repellent can cause cancer and defect in child birth & giddiness. Hence, natural mosquito repellents were ideal than chemical mosquito repellents (Nandini Rani et al.(2013). In the present study, efforts are taken for the development of nanotechnologically engineered herbal mosquito repellent coils from locally available herbal plants, which have eco-friendly profile for mosquito control. These mosquito repellent coils are safer and eco-friendly products.

MATERIALS AND METHODS

The raw materials used for making herbal mosquito repellent candles are charcoal powder, camphor, Jaggery, Lantana camera leaves, Ipomoea leaves, grinder mixture and silver nitrate (AgNO3).All these herbal plant leaves grinded in to fine powder with the help of grinder mixture. All raw materials mixed with herbal plant powder. Mixture is then taken in to the mixture grinder and mixed well; A paste is prepared by adding distilled water. Then pest is taken in to 1000 liter beaker and diluted the mixture for one liter distilled water. Then 0.5 gm AgNo3 is added in to the mixture and it get

centrifuged at 1000rpm speed. Mixture is then filtered by using Whitman filter paper. Then mixture is kept at room temperature for 24 hours. We got yellowish brown colour. It was indication of formation of nanoparticles in the mixture. Paste is prepared by adding excess herbal powder. The separate repellent products were prepared as Lantana camera Cakes, Ipomoea candles and control products without herbal plant powder.

Fig.1 Mosquito repellent candles

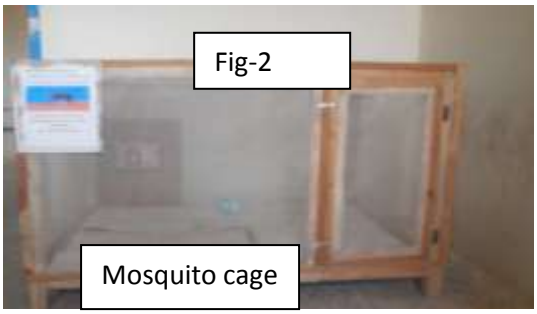

Fig.2 Testing of candles for mosquito repellent activity inside Mosquito cage

RESULTS AND DISCUSSION

Nanotechnologically prepared herbal mosquito repellent candles from locally available herbal plants were tested for observations of mosquito repellent activity inside Mosquito cage

Table1

Time	Repellent Products (candles)	Mosquito activities
Evening 6-8 pm	Lantana camera cake	55% Mosquitoes dropped down
Evening 8-10 pm	Ipomoea candles	90% Mosquitoes droped down
Evening 6-8 pm	Control	2% Mosquitoes dropped down

Table 1 shows the comparative effectiveness of Herbal mosquito repellent with control mosquito candle. 55% Mosquitoes dropped down with Lantana camera cake smoke while 90% Mosquitoes dropped down and very less mosquito activity observed with control. Herbal mosquito repellent contains nanoparticles which enters in respiratory system quickly and kills the mosquitoes. In control no nanoparticles hence very less mortality of mosquito.

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