

Production of Mosquitoes Repellents Insecticides (Mosquitoes Coil) using Orange Peels

Mohd Shoeb Abdul Mukhtar¹, Akash Chafekar², Salman Khan³, Bilal Sufi⁴

HOD, Department of Pharmacology, New Montfort Institute of Pharmacy, Ashti, Wardha¹

Students of Final Year, New Montfort Institute of Pharmacy, Ashti, Wardha²

Faculty, Kalamprakash College of Pharmacy, Khelda Karanja Lad

HOD, Pharmaceutics Department, New Montfort Institute of Pharmacy, Ashti, Wardha⁴

mohd.shoeb.7588@gmail.com

Abstract: *The main objective of the present study was to formulate mosquito repellent insecticide coil using orange peel. In this preparation limonene oil were used as insecticide limonene oil extract were taken than addition of ingredient such as activated charcoal, turmeric, camphor, water, coloring agent and flavoring agent at appropriate quantity, evaluation and characterization were performed for its safe and effective use. Mosquito-borne infections like dengue, malaria, chikungunya, etc. are a nuisance and can cause profound discomfort to people. Due to the objectional side effects and toxicity associated with synthetic pyrethroids, N,N-diethyl-3-methylbenzamide (DEET), N,N-diethyl phenylacetamide (DEPA), and N,N-diethyl benzamide (DEBA) based mosquito repellent products, we developed an essential oil (EO) based mosquito repellent cream (EO-MRC) using clove, citronella and lemongrass oil. Subsequently, a formulation characterization, bio-efficacy, and safety study of EO-MRC were carried out. Expression of Anti-OBP2A and TRPV1 proteins on mosquito head parts were studied by western blotting.*

Keywords: mosquito repellent

I. INTRODUCTION

Insecticide is a substance or a mixture of substances used for killing insects. It is well known fact that many protozoal bacteria diseases are transmitted from man to man by insects. One may combat these diseases not only by means of prophylactic drugs but also by the destruction of the insects carriers.

Insecticide is a chemical compound that is lethally toxic to insects either by ingestion or by body contact. It is applied to vegetation, crops and insect breeding areas either as liquid spray or as dry powder.

They are used in agriculture, medicine, industry and household. The use of insecticides is believed to be one of the major factors behind the increase in agricultural productivity in 20th century

Nearly all insecticides have the potential to significantly alter ecosystem, many are toxic to human and others are concentrated in food chain. It is necessary to balance agricultural needs with environmental and health issues when using insecticides. It is crucially important that all the rural areas in Nigeria are being educated on the need to eradicate insects especially mosquitoes that might breed around the environment and transmit malaria to people living within the enclave Years now. Efforts are geared towards controlling malaria infestation both in urban and rural areas. A lot of measures are being taken to reduce the number of death as a result of malaria, we hear now and then that numbers being quoted by the analyst that died of malaria attack Thus, free mosquitoes treated nets are always distributed to families and individuals all in a bid to reduce malaria attack from mosquito bite

In the light of this, it is necessary to study God-given substances in this case, plant that has embedded substances that will help man combat mosquitoes or at least reduce infestation to the barest minimum.

Mosquito repellents are substances that can be used to repel mosquitoes which is a vector that transmits malaria. A typical example of a mosquito repellent is mosquito coil which drives away mosquito when it is ignited. The smoke that is emitted from burning a mosquito coil contains active ingredients used to prevent mosquito from biting particularly during the hour of sleep having been designed to burn for hours. These active ingredients have known to act as repellent agent which cause a distasteful environment for the mosquito and act as agents of immobilization which disturbs the

food searching mechanism of the mosquito. Orange peels (Cestrum) contains oil known as Limonene oil which has a lethal effect on mosquitoes and some other insects. It can be used as active ingredient to produce mosquito coil, which when ignited, will repel mosquitoes within the limits of the smoke.

1.1 Objectives of The Study

The purpose of this work is to produce mosquito repellants using orange peels (cestrum) wastes perse which will save the cost of production and purchase. thereby increasing its availability especially in the rural areas. If the work is successful. production of mosquitoes repellants using orange peels will provide source of employment to our teaming youths and also make mosquito repellent within the reach of everybody, thereby reducing the number of death due to malaria caused by mosquito bite. insecticides, specifically mosquito coils, using orange peels

Orange peels contain Limonene oil, which has a lethal effect on mosquitoes and some other insects, and can be used as an active ingredient in the production of mosquito coils. The use of orange peels as a raw material for mosquito repellent production can save the cost of production and purchase

The mosquito coils produced from orange peels, when ignited, will repel mosquitoes within the limits of the smoke. An insect repellent will help protect you from mosquitoes that spread malaria and other diseases, such as dengue, chikungunya, and Yellow fever. We can use an insect repellent on your skin and clothes to keep away (repel) insects.

Your doctor may also prescribe you a medication to prevent malaria (antimalarial drug). the spray-on repellents containing 98% DEET or 30% PMD had the highest efficacy in repelling mosquitoes compared to repellents with other ingredients. From the five wearable devices that we tested, only the one that releases Metofluthrin significantly reduced the numbers of attracted mosquitoes. There are some specific objectives for the study are as follows:-

Overall objective; to asses repellency and larvicidal activity of selected plants with aim of of developing a mosquito repellent prepration from these plants

Specific objectives

- To perform acute dermal irritation/corrosion test according to laid down procedures.
- To evaluate mosquito replent activity of the selected plants.
- Assess larvicidal activity of the selected plants.
- To develop a suitable mosquito relent from the selected plants that is safe and efficacious to use.
- To compare the meant biting frequency for the insect repellents.
- To determine which of the insect relent variant provides the best protection against mosquito bites.

Active Ingredients In Mosquito Repellent Coil

The major active ingredients used in the production of mosquito repellent coil arepyrethrum, pyrethrins, allethrin, esbiothrin, meperfluthrin, butylated hydroxytoluene(BHT), piperonylbutoxide (PBO).

Pyrethrum

Pyrethrum is a natural plant oil that occurs in the two species of pyrethrum daisy, Tanacetumcinerariifolium from the Dalmatian region and Tanacetumcoccineum of Persian origin. The insecticidal component, comprisingpyrethrins, it's found in tiny oil-containing glands on the surface of the seed case in the flower head. It is an extremelyeffective insecticide, while it has been used for centuries against all manner of insect pests, is relatively harmless to mammals (R.A cloyd etal., 2004).

Pyrethrins

The extract of the insecticidal chemicals in pyrethrum is called a pyrethrins. They are amixture of six chemicals that are toxic to insects. Pyrethrins are commonly used to control mosquitoes, fleas, flies, moths, ants, andmany other pests.

Butylated-Hydroxytoluene (Bht)

Butylated hydroxytoluene (BHT), are compounds also known as dibutylhydroxytoluene, it is a lipophilic organic compound, a chemically derivative of phenol, that is useful for its antioxidant properties. Butylatedhydroxytoluene is an antioxidant due to its ability to hunt free radicals.

Allethrins

The allethrins are a group of related synthetic compounds used in insecticides. They are synthetic pyrethroids, a synthetic form of a chemical found in the chrysanthemum flower. They were first synthesized in the United States by Milton S. Schechter in 1949

Piperonyl Butoxide(Pbo)

Piperonylbutoxide(PBO) is an organic compound used as a component of pesticide formulations. It is a waxy white solid and act as a synergist.

That is, despite having no pesticidal activity of its own, it enhances the potency of certain pesticides such as carbamates, pyrethrins, pyrethroids, and rotenone. It is a semisynthetic derivative of safrole (Robert L et al., 2002).

Mosquito coils are a type of mosquito-repelling incense that is usually made into a spiral and typically made using dried paste of pyrethrum powder. Pyrethrum is the first and most important ingredient used in mosquito coils, which is derived from the chrysanthemum plant and is a natural chemical found in the coil that aids in mosquito repellent

Other active ingredients found in mosquito coils may include pyrethrins, allethrin, and esbiothrin

Mosquito coils work in one of two ways. Those that contain insecticides will kill (or at least “knock down”) mosquitoes, while those that contain aromatic substances (such as citronella) will repel mosquitoes or reduce the likelihood they’ll bite.

Mosquito coils also contain products that hold the coil together and enable it to smolder slowly

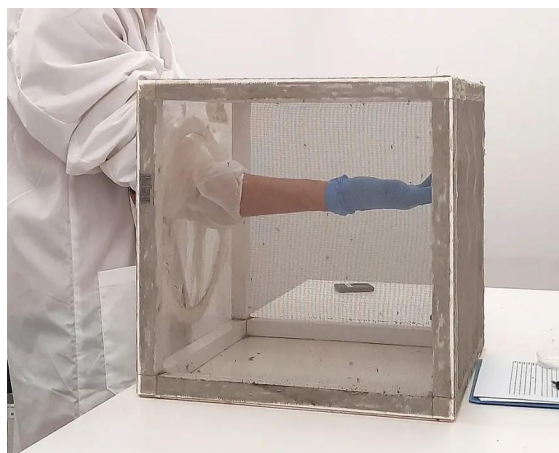
Traditional mosquito coil compositions include approximately 25% or more of a residue from preparing pyrethrum known as pyrethrum marc, as it is thought this material is a necessary ingredient to produce an acceptable mosquito coil.

The prime burning agent or fuel used for mosquito coils is coconut shell flour, tabu powder, sawdust, ground leaves, ground bark, starch, etc. Mosquito coils are considered to be safe insecticides for humans and are generally effective at reducing mosquito bites

However, they are only deterrents and do not guarantee that your outdoor space will be fully protected

Method of Preparation

1) Cage method : Take the mosquito cage ,add few of mosquito then smok the coil and keeping it near the cage , the mosquito dies in at least 10 minutes.



2) Fresh orange peel & others active ingredient were purchased from India market The orange peel was washed in water , and mix in the two full night then extract was filtered & alcohol was added and Limonene oil were extracted .



3) Repellent coil preparation : The oil from orange fruits contains Limonene , the extracted oil from the orange was used to prepare insecticide, &limonene oil is all thatis needed to make insecticide coil

II. PROCEDURE OF EXPERIMENTAL WORK

Orange Peel Extension: Mixing of orange peel and water , leave it for two days Filters of extract Filter the obtain solution and extract it Mixing various components Add Limonene oil , water, camphor , turmeric , activated charcoal powder Colouring and flavourings agents to the solution. Giving shape & size Heat the solutionand make a proper paste of it .Then Mould the paste for obtaining respective size.

Here is a detailed procedure for experimental work on mosquito repellent based on the search results:

- 1) For each product test, three batches of 50 female mosquitoes are placed in cages 30x30x30 cm inside the testing room
- 2) Before the start of each test, a bare arm with a gloved hand is inserted into the cage for 30 seconds to assess the biting readiness of the mosquitoes. Only cages with at least ten mosquitoes landing within 30 seconds are used in subsequent testing.
- 3) Following the combined fitness/control test, the product is applied onto the right arm at the WHO standard rate of 1 ml per 600 cm² for the Mosquito Insect Repellent and DEET, and at a rate of 2 mg per cm² for the Sunscreen Repellent. The arm is then inserted into the cage for 30 seconds and the number of mosquitoes probing on the arm counted and recorded. The procedure is repeated with a total of three cages.
- 4) Tests can be conducted by placing the repellent-treated forearm into a test cage for 3 minutes, at 30-minute intervals, until the test subject receives two or more mosquito bites in the same observation period or one bite each in two.
- 5) The effectiveness of the repellent can be tested by releasing 40 mosquitoes into an aquarium, applying DEET and lemon grass oil to participants' hands, and counting the number of mosquitoes that come to rest on the participants' hands. The number of mosquitoes probing the untreated arm can be counted at the end of the 30-second test. The results can be compared to determine the effectiveness of the repellent.
- 6) The experiment can be repeated by comparing the effectiveness of other natural mosquito repellents like Neem oil or eucalyptus oil in keeping flies away from food.
- 7) A protocol has been developed for the indoor evaluation of candidate spatial repellents intended for use in push and pull systems. The testing environment can be maintained at 27°C and 65% RH. Thirty minutes before the start of a test, the forearm of a human subject can be treated with repellent between the elbow and the wrist at the rate of 1 ml of formulated product/650 cm² of skin surface area. A latex glove can be worn over the hand to protect from mosquito bites

Chemical Used and Quality

Sr. no	Common	Category	Quality
1)	Limonene oil	Insect Repellent	15ml
2)	Activated charcoal	ReducesEmission oftoxins	2gm
3)	Turmeric	Mosquito repellentnatural insecticide	2gm
4)	Camphor	Natural insecticide	2gm

5)	Colouring And Flavouring Agents	Artificial components	2gm
6)	Water	Natural ingredients	15ml

Formulation Table

Sr.no	Chemical names	Limonene oil(C10 H16)
1)	Molar mass	136.238g mol-1
2)	Density	0.8411g/ cm3
3)	Melting point	74.35 °C
4)	Toxicity	(LD50) – low toxicity basedupon lethal dose.
5)	Appearance	Colorless liquid
6)	Odor	orange

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Project Images



Fig. Mosquito repellent coil .



Fig. Dead mosquito using coil.

Observation Table

Sr no	Test Name	Obtained value	Standard value
1)	Colours	A little yellow	Colourless liquid
2)	Test for chemical	Mosquito larvicides	Larvicidal effectand Aedes albopictus
3)	Mosquito killingtime	Shows early effects	Fast and effective
4)	Test for toxicity	0.90 %	0.99 %

III. RESULT

On the basis of evaluation study and observation it is found that formulation of mosquito repellent coil was done successfully using cage test method . toxicity study was done ,it is found that.

IV. CONCLUSION

This mosquito coil is made using orange peel it does not have any side effects for humans and Small children mosquito coil made from these herbal products it very beneficial for repelling Mosquitoes and human health .On the basis of result obtained the mixture of orange peel and 25 %water was the most effective. Among the solution, setup of orange peel and water. Furthermore, it was also concluded that the more concentrated the solution the more it is to Repel or kill mosquitoes used other fruits in testing the efficiency of the given product.

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