

# Mosquitoes Coil (Insecticides Repellants)

## Production using Orange Peels

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**Abstract:** *The primary goal of this project was to create an insecticide coil that repels mosquitoes using orange peel. This preparation used limonene oil as an insecticide. After extracting the limonene oil and adding ingredients like water, camphor, turmeric, activated charcoal, and flavoring and coloring agents in the right amounts, it was evaluated and characterized to ensure that it could be used safely. Infections spread by mosquitoes, such as dengue, malaria, chikungunya, etc., are bothersome and can seriously injure humans. We created an essential oil (EO) based mosquito repellent cream (EO-MRC) using clove, citronella, and lemongrass oil in response to the unfavorable side effects and toxicity linked to synthetic pyrethroids, N,N-diethyl-3-methylbenzamide (DEET), N,N-diethyl phenylacetamide (DEPA), and N,N-diethyl benzamide (DEBA) based mosquito repellent products. Following that, a formulation characterisation, safety, and bio-efficacy investigation were conducted for EO-MRC. Western blotting was used to examine the expression of TRPV1 and Anti-OBP2A proteins on mosquito head sections.*

**Keywords:** mosquitoes

### I. INTRODUCTION

A chemical or combination of chemicals used to kill insects is called insecticide. It is common knowledge that insects carry a large number of diseases caused by protozoal bacteria to humans. In addition to using prophylactic medications, one can fight these illnesses by eliminating the insects that carry them.

A chemical molecule known as an insecticide is lethally harmful to insects when they swallow it or come into contact with it. It is sprayed on plants, crops, and insect breeding grounds as a dry powder or as a liquid spray.

They are employed in the home, business, medical field, and agriculture. One of the main causes of the 20th century's growth in agricultural production is thought to have been the usage of pesticides.

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.

### Objectives of The Study

The goal of this project is to create mosquito repellents at a lower cost of manufacture and purchasing by utilizing orange peels (cestrum) wastes. thereby making it more accessible, particularly in rural places. in the event that the work is accomplished. By producing insect repellents from orange peels, we can reduce the number of deaths from malaria caused by mosquito bites while also giving our teaming adolescents a source of work and making mosquito repellent accessible to everybody. pesticides that use orange peels, particularly mosquito coils

The oil found in orange peels, known as limonene, is deadly to mosquitoes and certain other insects. It is also a useful component in mosquito coil manufacturing. The cost of manufacturing and purchasing mosquito repellent can be reduced by using orange peels as a raw material.

When lit, the orange peel mosquito coils will keep mosquitoes away from the area covered by the smoke. Using an insect repellent can help shield you against mosquitoes that can carry diseases including dengue, chikungunya, and yellow fever, in addition to malaria. To keep mosquitoes away, we can apply an insect repellent to your skin and clothing.

Additionally, your doctor could advise you to take an antimalarial treatment to avoid malaria. When it came to repelling mosquitoes, spray-on repellents with 98% DEET or 30% PMD had the most efficiency when it came to other chemicals. Only the wearable that releases metofluthrin considerably decreased the amount of mosquitoes that were attracted out of the five that we tested. The following are some particular goals for the research:

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.

### **Allethrin**

The allethrin 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.

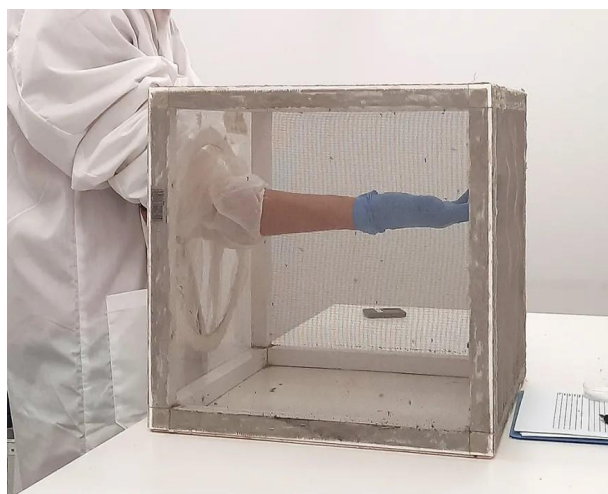
Mosquito coils also contain products that hold the coil together and enable it to smolder slowly. Traditional mosquito coil compositions include approximately 25% or more of a residue from preparing pyrethrum known as pyrethrum marc, as it is thought this material is a necessary ingredient to produce 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.

## **II. 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 that is needed to make insecticide coil

### III. PROCEDURE OF EXPERIMENTAL WORK

Extension with orange peel: Combine orange peel with water and let sit for two days. extract filters Extract the solution after filtering it. Blending different ingredients together Add the water, camphor, turmeric, limonene oil, and powdered activated charcoal. adding flavorings and colorings to the mixture. defining size and shape After heating the mixture, properly paste it. Next, mold the paste to the appropriate size.

Based on the search findings, the following is a thorough protocol for conducting an experimental study on mosquito repellent:

- 1) Inside the testing room, three batches of fifty female mosquitoes are housed in cages measuring 30 by 30 by 30 centimeters for each product test.
- 2) To determine whether the mosquitoes are ready to bite, a bare arm with a gloved hand is placed inside the cage for 30 seconds before to the start of each test. In the tests that follow, only cages where ten mosquitoes or more land in less than 30 seconds are included.
- 3) The product is given to the right arm at the WHO-recommended rates of 1 ml per 600 cm<sup>2</sup> for DEET and Mosquito Insect Repellent, and 2 mg per cm<sup>2</sup> for Sunscreen Repellent, after the combined fitness/control test. After 30 seconds of the arm being within the cage, the number of mosquitoes that are probing it is counted and noted. With a total of three cages, the process is repeated.
- 4) To conduct tests, the test subject's forearm coated with repellent can be placed into a test cage for three minutes at 30-minute intervals, or until the test subject experiences two bites from mosquitoes in one observation period, or one bite every 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 procedure for testing potential spatial repellents indoors that are meant to be used in push and pull systems has been established. 27°C and 65% relative humidity can be maintained in the testing environment. A human subject's forearm, between the elbow and the wrist, can be treated with repellent thirty minutes prior to the start of the test at a rate of one milliliter of designed product per 650 centimeters of skin surface area. To avoid getting bitten by mosquitoes, one should cover their hands with a rubber glove.

**Chemical Used and Quality**

Sr. no	Common	Category	Quality
1)	Limonene oil	Insect Repellent	15ml
2)	Activated charcoal	Reduces Emission of toxins	2gm
3)	Turmeric	Mosquito repellent natural 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 <sup>-1</sup>
2)	Density	0.8411g/ cm <sup>3</sup>
3)	Melting point	74.35 °C
4)	Toxicity	( LD50) – low toxicity based upon lethal dose.
5)	Appearance	Colorless liquid
6)	Odor	orange

**Use of ingredients**

Sr. no	Ingredients	Uses
1)	Limonene oil	Use for flea & tick control on pets, as an insecticide spray
2)	Activated charcoal powder	For reducing emissions of toxins in mosquito coil
3)	Camphor	Used in excellent natural insecticide
4)	Turmeric	It's strong aromatic as a mosquito repellent.
5)	Colouring and flavouring agents	Mostly brown repellent is used because of their low toxicity.
6)	Coconut cell powder	Binding agent

**Project Images**

Fig 4.5.1 Mosquito repellent coil .



Fig 4.5.2 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 %

**IV. 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.

**V. 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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