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Crafting of Mosquito Repellent Dhoop Using Orange Peels & Eucalyptus oil.

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Abstract:
Mosquito-borne diseases pose a significant global health threat, with mosquitoes transmitting deadly illnesses like malaria and dengue fever. Existing mosquito repellents often contain chemicals such as DEET (N, N-Diethyl-meta-toluamide), which can lead to skin irritation, allergies, and other adverse effects with prolonged or excessive use, raising health concerns.
This study explores an alternative approach utilizing orange peels for mosquito repellent dhoop production. Orange peels are rich in essential oils, particularly limonene, which possess natural repellent properties against mosquitoes. By repurposing citrus waste materials, this method not only offers a sustainable and eco-friendly solution but also contributes to reducing environmental waste.
This research investigates the effectiveness of orange peel-based dhoop as a safe and natural alternative to conventional mosquito repellents, emphasizing its potential to mitigate health risks associated with chemical-based products while promoting environmental sustainability.

Keywords: Mosquito, limonene, DEET, Orange peel

Introduction:

The orange is a fruit belongs to the family Rutaceae, probably originated from regions comprising of Southern China, Northeast India and Myanmar (Nicolosi et al, 2000) [1]. Orange is well known for most rich sources of vitamin C, it also contains considerable amounts of carotenoids,flavonoids, essentials oils and some minerals(Topuz et al, 2005) [2]. Today, a huge quantity of fruit and vegetable wastes (FVW) and primary by-products from the fruit and vegetables processing industry are being thrown in landfills or a river, causing environmental pollution (Wadhwa et al, 2013) [3]. Utilization of waste from fruit and vegetable processing industries as local resource is one of the important and challengeable jobs around the world. The discarded fruits as well as its waste materials have been utilized as a low cost biosorbent, a substrate for the production of various enzyme and metabolites and further used for the extraction of bioactive components and functional ingredients, and livestock feed, etc.(Upadhya et al, 2010) [4]. Fruit peel is one of the most important by-products from which a variety of active ingredients can extract, it has great value, which is used to transform waste into treasure and ameliorate the utilization rate of raw materials (Chaoijn Wang, Qinghua Lai, 2016).(5)
Mosquito-borne diseases continue to pose significant global health challenges, necessitating the exploration of innovative and environmentally friendly solutions for mosquito control. This study focuses on the development of a novel mosquito repellent dhoop using orange peels, leveraging the natural insect-repelling properties of orange peel oils. The aim is to offer a sustainable alternative to conventional mosquito repellents by utilizing readily available and biodegradable materials.

The developed orange peel mosquito repellent dhoop presents a sustainable and environmentally friendly option for mosquito control. The orange peel oils not only contribute to its repellent efficacy but also impart a pleasant aroma during combustion. The study underscores the importance of conducting controlled environment tests to ensure safety and efficacy. When burned like traditional dhoop coils, the dhoop releases smoke containing orange peel oil vapors, forming a protective barrier against mosquitoes(6).

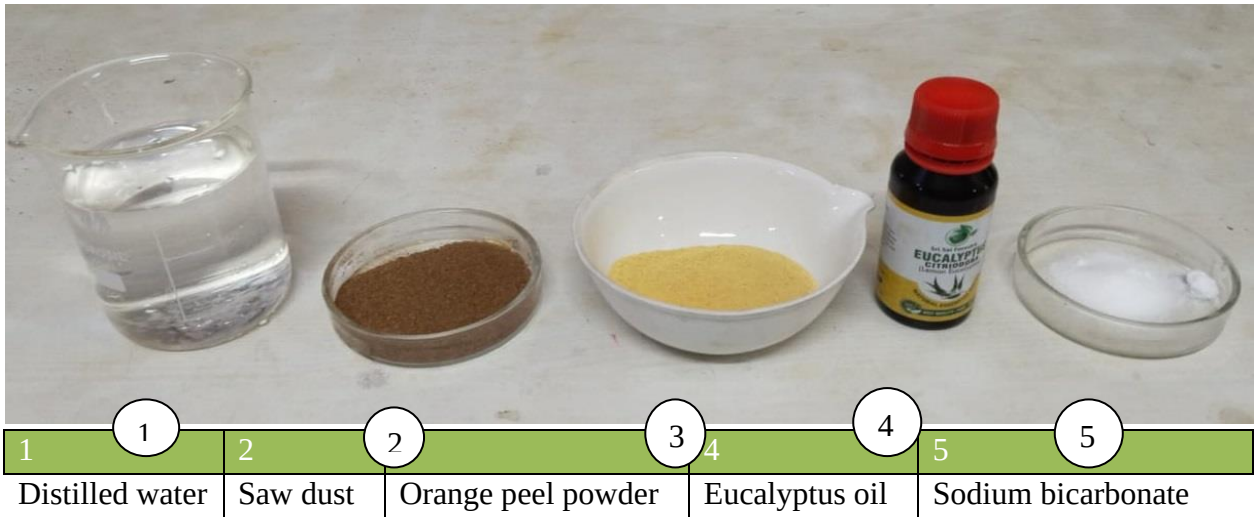
While acknowledging that the efficacy may not match that of commercial products, this natural repellent serves as a viable and eco-friendly solution, particularly in regions where mosquito-borne diseases are prevalent.

Chemical Constituents:

Dried orange peels
Essential oil (*Eucalyptus Oil)*
Distilled water
Saw dust

Methodology:

Ingredients:



1. After naturally drying orange peels in sunlight, they were collected for further processing.
2. The grinder pulverized the dried orange peels into a fine powder.
3. A paste was meticulously crafted using 4 gm of powdered orange peel, 1 gm of NaHCO3, 1 gm of wood powder, 8 ml of distilled water, and 0.5 ml of eucalyptus oil, ensuring a perfect blend for optimal consistency.
4. A rectangular piece of cardboard or thick paper was cut and rolled with the orange peel paste to form a customized dhoop, tightly packed and shaped evenly.
5. The dhoop was left in a cool, dry place to air dry completely, a process that could span from a few days to a week depending on local humidity levels.
6. 6)Once thoroughly dried, lighting one end of the dhoop coil created a slow-burning mosquito repellent, best placed in a fire-safe holder or tray for safe use, akin to traditional mosquito coils.

Result:

a. The dried dhoop sticks were burned in a controlled environment to test their effectiveness.
b. The smoke produced was observed to have a pleasant citrusy aroma with a hint of eucalyptus.
c. Mosquitoes were repelled effectively within a radius of 2-3 meters during the burning process.

Fig: Making Coil of orange pills

Conclusion:

The mosquito repellent dhoop crafted using dried orange peels, eucalyptus oil, sawdust, and distilled water proved to be an effective and eco-friendly solution for repelling mosquitoes. The combination of orange peels and eucalyptus oil not only provided a natural fragrance but also acted as a potent mosquito repellent. The sawdust acted as a binding agent and helped in maintaining the shape of the dhoop. This DIY dhoop is a sustainable alternative to chemical-based repellents, making it safe for indoor use. Further experimentation can be done to optimize the ratio of ingredients for longer-lasting effects and improved durability.

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