ISSN–2278-5655

AMIERJ Aarhat Multidisciplinary International Education Research Journal

Volume–XIV, Special Issues– IV Jan – Feb, 2025

OPEN ACCESS Original Research Article

THE COMPREHENSIVE STUDY OF MOSQUITO REPELLENT BY USING ORANGE PEEL

** Khushboo Vinod Gupta*

** SYBMS, Matrushri Kashiben Motilal Patel Senior College of Commerce and Science, Thankurli (E)*

Abstract:

Mosquito-borne diseases remain a major global health concern, driving the demand for safe and sustainable mosquito repellent solutions. This study focuses on developing and evaluating an incense cone infused with orange peel (Citrus sinensis) extract as a natural mosquito repellent. Orange peel, a byproduct rich in essential oils like limonene, exhibits strong insect-repellent properties. The research involves the extraction of essential oils through steam distillation and their incorporation into incense cones made from biodegradable materials. The effectiveness of the orange peel incense cones is tested against common mosquito species in controlled environments. Results demonstrate that the cones provide significant repellent activity, reducing mosquito presence effectively during use. This eco-friendly product not only repurposes agricultural waste but also offers a safer alternative to synthetic chemical repellents. Further studies are recommended to optimize the formulation, assess long-term safety, and evaluate field performance under varying environmental conditions.

Key Words: *Eco-friendly mosquito repellent , dry orange peel powder, reused of waste material.*

Objective of Study:

- To compose eco-friendly mosquito repellent.
- To assess the effectiveness of orange peel cones

Introduction:

Mosquito-borne diseases pose a significant threat to public health worldwide. The increasing resistance to chemical-based mosquito repellents has led to a growing need for eco-friendly and sustainable solutions. In response, our team has developed the Orange Peel Incense Cone, a natural mosquito repellent made from dried orange peels. This innovative product offers a safer, more environmentally friendly alternative to traditional mosquito repellents.

Scope of Product Development:

1. Source high-quality dried orange peels.
2. Develop a proprietary blend of natural ingredients.
3. Design and manufacture the incense cone

Limitation:

1. Storage and transportation
2. Regulatory control
3. Consumer acceptance
4. Duration of repellacy

Methodology:

Primary data: By Distributing sample of orange peel mosquito repellent product in the area of society.

Literature Review:

Efficacy of orange peel as a mosquito repellent Apoorva Gupta, Archana Singh*International Journal of Home Science 3 (2), 143-146, 2017* The textile sector is facing new challenges in the modern days and every technician is giving the best to face these challenges, the world that world lead us would be astonishingly hi tech and materialistic. To ensure our security and safety from the future hazards, we need equally developed technology for our protection. Protective textiles are among one such smart application of smart technology in textiles. Protective textiles refer to those textile products which have a functionality of giving protection from something in some or the other sense. Mosquito repellent finished textiles are also a part of

ISSN–2278-5655

AMIERJ Aarhat Multidisciplinary International Education Research Journal

Volume–XIV, Special Issues– IV Jan – Feb, 2025

OPEN ACCESS Original Research Article

protective textiles. Which help in protection from the species that are prone to cause damage in some or the other manner. Mosquito are among the most common and widely distributes insects. It has earned a worldwide reputation as torturers of man and also diseases carry. Mosquito are classified as one of the deadliest pests known to man. The activity of mosquito is affected by climate, light and temperature. Mosquito repellent textile is one of the revolutionary ways to advance the textile field by providing the much-needed features of driving away mosquitoes, especially in the tropical areas. It protects the human being from the bite of mosquitoes and there by promising safety from the mosquito borne disease, such as malaria, dengue fever, chicken gunia and filarial. Most plant contains compounds that they use in preventing attack from phytophagous (plant eating) insects. These chemicals fall in to several categories including repellents, feeding deterrents, toxins and growth regulators. Repellents of plant origin do not pose hazards of toxicity to human and domestic animals and are easily biodegradable. Natural products are safe for human when compared to that of synthetic compounds. Plant-based repellents have been used for generations in traditional practice as a personal protection measure against host-seeking mosquitoes. The abundance of plants on the earth surface has led to an increasing interest in the investigation of different extracts obtained from the traditional plants as potential sources of new mosquito repellent agent. The current study is mainly carried out for the development of mosquito repellent cotton fabric using “orange peel” extracts.

Review of Herbal Mosquito Repellent

Malati R Salunke, Sonu C Bandal, Dinesh Choudhari, Tejaswini Gaikwad, Mahima Dubey *Int. J. Sci. Dev 7, 204-214, 2022* Mosquito is a deadliest pest known to man. Prevention of mosquito bites is one of the best intervention methods to reduce disease. Various mosquito repellents are used in day to day lives which are synthetic and continue use of these repellents can cause health hazards and environment hazards. From ancient times various plants are used in form of repellents, fumigants and insecticidal agents. Most of the plants contain phytochemicals which they use as repellent in preventing attacks from various insects. The current paper summarizes research aimed at developing safe and effective herbal insect repellent compositions. In ancient times orange seeds and peel powder were used as insecticide. The dried peels of most citrus fruits have been used in various ways in controlling pest. Orange oil extracted from peels of orange can be used as repellent. It consists majorly Limonene a monoterpene which gives orange oil a peculiar odor and taste which shows repellent properties. Linalool which has perfumery property also shows repellent properties against insects which is widely used as flavoring agent and in production of perfumes. It has been also used in both topical preparations and combustible products as. It can be used instead of synthetic repellent as it has beneficial uses for humans in concern of health and low risk of side effects. Our study aims at investigating the repellent activity of phytochemical extracts (orange oil) from orange peels.

Summary About our project:- orange mosquito repellents generally cover several key aspects: efficacy, composition, and safety.

- Problem: Mosquitoes are the carriers of severe and well-known illnesses such as malaria, arboviral encephalitis, dengue fever, chikunguniya fever, West Nile virus and yellow fever.
- Solution: orange mosquito repellents, based on above reviews our project is totally herbal because we were using various type of regular contains which is eco-friendly like dry orange peel powder, coconut shell powder, sandal powder, ghee for binding etc.

ISSN–2278-5655

AMIERJ Aarhat Multidisciplinary International Education Research Journal

Volume–XIV, Special Issues– IV Jan – Feb, 2025

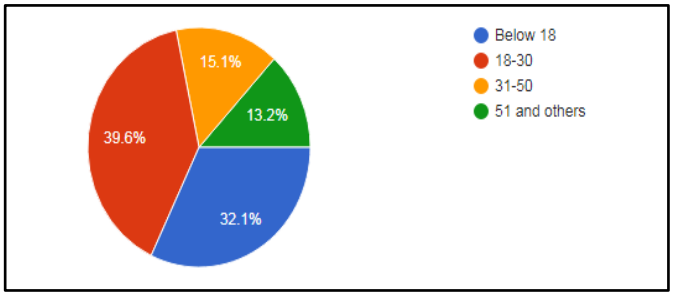
OPEN ACCESS Original Research Article

- As per all reviews no one made any type of cone of orange repellent but our product not type any coil or spray it's in the of cone as it burns easily. So, it's very different according to above reviews.

  Here is a sample questionnaire for evaluating orange peel incense cone as mosquito repellents:

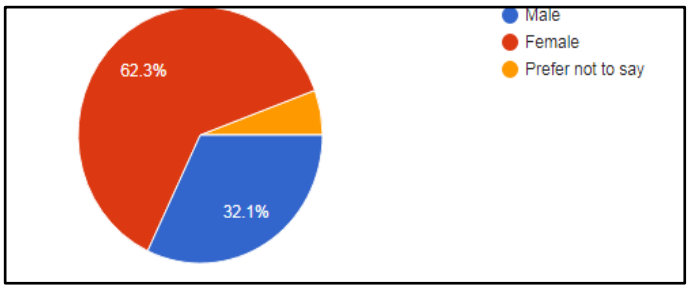
Data Analysis and Interpretation:

1. AGE



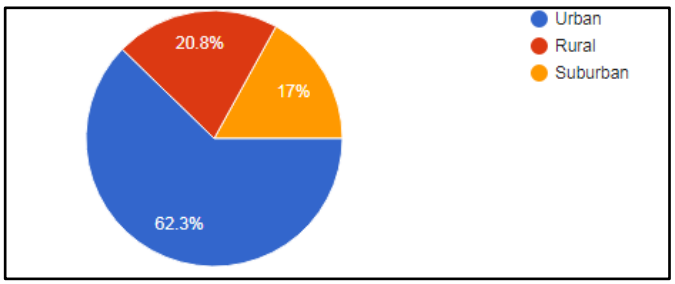
Here , there are 32.1% of below 18, 39.6% of 8-30, 15.1%of 31-50, 13.2% of 51 above age

2. GENDER



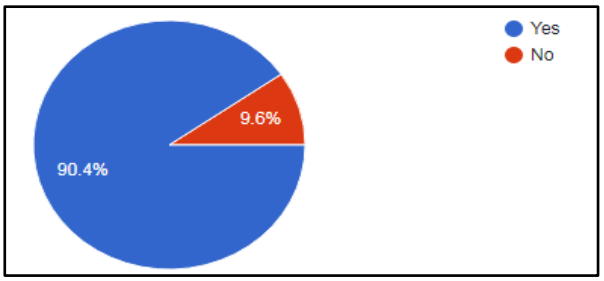
Here, there are 62.3%female, 32.1% male, and some of them prefer not to say.

3. LOCATION



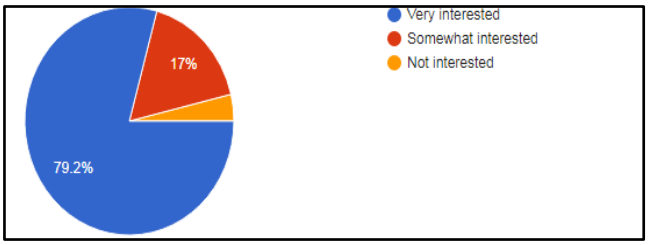
Here, there are 62.3% person living in urban ,20.8% living in rural, and 17% in suburban.

4. DO YOU LIKE THIS PRODUCT?



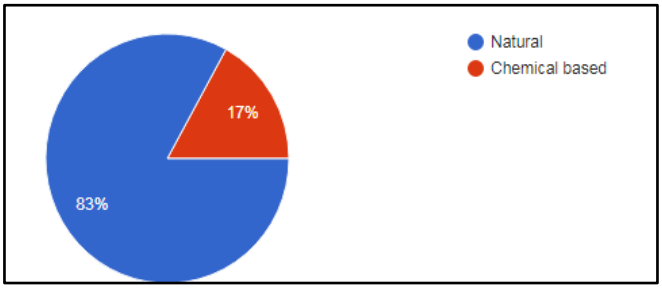
Here, there are 90.4% people who like our product ,and 9.6%who didn't like the product

5. HOW INTERESTED ARE YOU IN THIS IDEA?



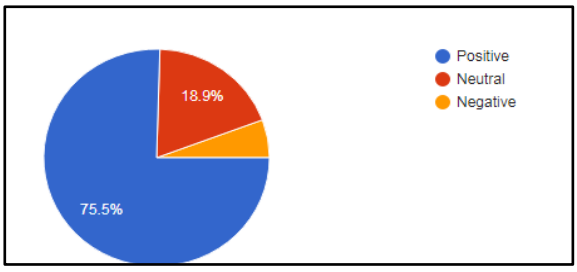
here, there are 79.2% people who are very interested in our product,17% and somewhat are not interested

6. WHAT TYPE OF MOSQUITO REPELLENT DO YOU CURRENTLY USED?



Here, there are 83%of people who used natural products, and 17% people who used chemical based products

7. WHAT IS YOUR FIRST REACTION TO SEE THIS PRODUCT?



ISSN–2278-5655

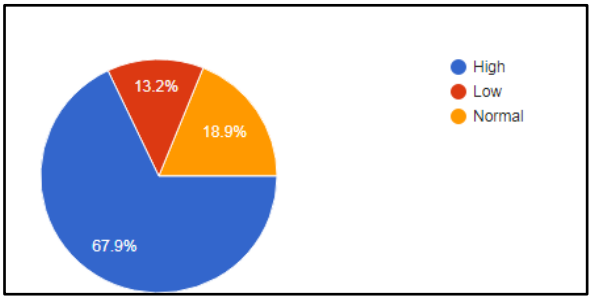
AMIERJ Aarhat Multidisciplinary International Education Research Journal

Volume–XIV, Special Issues– IV Jan – Feb, 2025

OPEN ACCESS Original Research Article

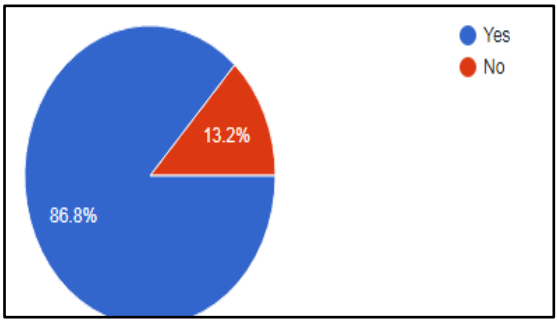
Here there are 75.5% people who thinks are product have positive reaction, 18.9% people think it is it have neutral reaction, and somewhat peoples have negative reaction on our product.

8. HOW WOULD YOU RATE OUR PRODUCT?



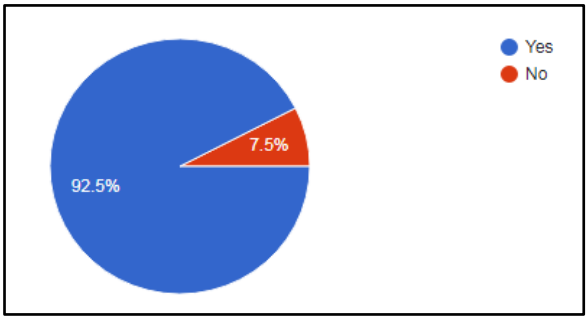
Here there are 67.9% peoples rate are product high, 13.2% people rate product as low, 18.9% people rate are product as normal.

9. DO YOU THINK ORANGE CONES WILL SAFE FOR CHILDREN'S AND PETS?



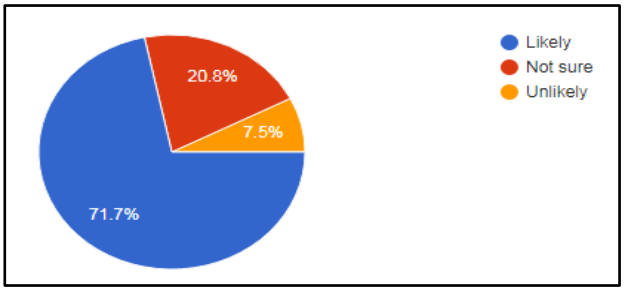
Here, there are 86.8% peoples reply yes, and 13.2% people reply no.

10. DO YOU BELIEVE ORANGE PEEL CONES CAN REDUCE ENVIRONMENTAL POLLUTION?



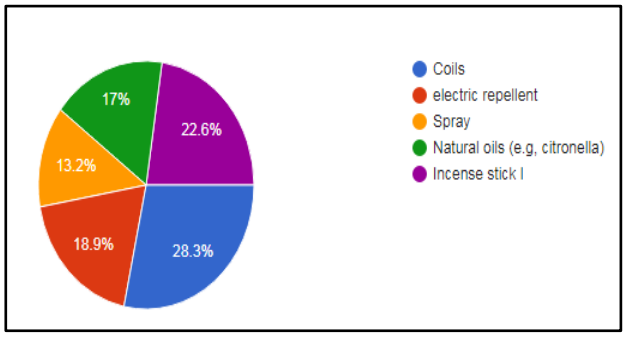
Here, there are 92.5% people replies yes, and 7.5% people replies no.

11. HOW LIKELY ARE YOU PURCHASE THIS PRODUCT TO YOUR FRIENDS AND CHANNELS?



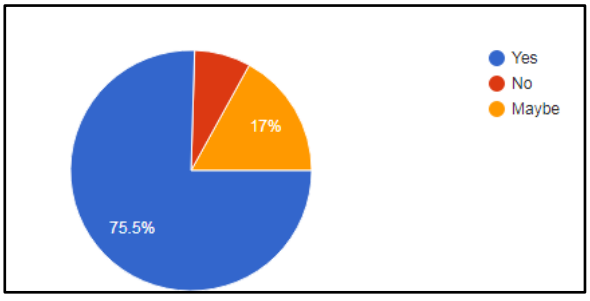
Here, they are 71.7% people replies likely, 20.8% peoples reply not sure, and 7.5% peoples replies unlikely

12. WHAT METHOD DO YOU CURRENT USE TO REPEL MOSQUITO?



here, there are 28.3% peoples use coils, 22.6% peoples use incense stick, 18.9% people use electric repellent , 17% people use natural oils, 13.2% people use spray.

13.WILL YOU CONSIDER USING ORANGE PEEL INCENSE CONE REGULARLY AS A MOSQUITO REPELLENT?



Here there are 75.5% peoples replies yes, 17% people replies maybe, and some peoples replies no

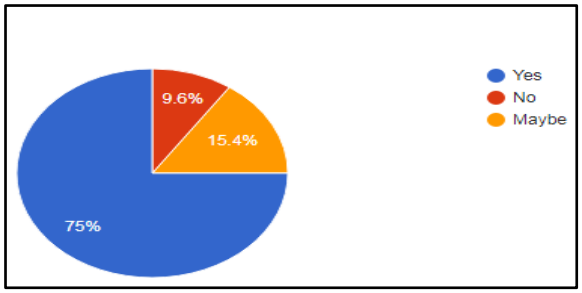
ISSN–2278-5655

AMIERJ Aarhat Multidisciplinary International Education Research Journal

Volume–XIV, Special Issues– IV Jan – Feb, 2025

OPEN ACCESS Original Research Article

14. HAVE YOU HAD A PROBLEM WITH OUR PRODUCT CAN YOU SPECIFY WILL YOU PURCHASE OUR PRODUCT?



Here, there are 75% people reply yes, 9.6% people replies no, and 15.4% people replies maybe

Conclusion:

Orange peel mosquito repellent incense cones offer a natural and effective solution to keep mosquitoes at bay. With their refreshing citrus aroma and eco-friendly composition, these incense cones provide a chemical-free alternative for pest control. Ideal for both indoor and outdoor use, they ensure a safe, pleasant, and sustainable way to enjoy a mosquito-free environment.

References:

1. *Efficacy of orange peel as a mosquito repellent Apoorva Gupta, Archana SinghInternational Journal of Home Science 3 (2), 143-146,*
2. *Malati R Salunke, Sonu C Bandal, Dinesh Choudhari, Tejaswini Gaikwad, Mahima Dubey Int. J. Sci. Dev 7, 204-214, 2022*
3. *Kadarkarai Murugan, Palanisamy Mahesh Kumar, Kalimuthu Kovendan, Duraisamy Amerasan, Jayapal Subrmaniam, Jiang-Shiou Hwang Parasitology research 111, 1757-1769, 2012*
4. *Promoting health: Introducing an eco-friendly herbal mosquito repellent extracted from local sweet orange peels Yisa Adeniyi Abolade, Abayomi Adegoke, Samuel Mensah Noi, Chisom Maureen Nwoye, Omolade Ajayi, Onah Kyrian, Berther Onyenachi Akagbue, Tasha Siame, Adeyemi Adeesan Bamidele GSC Biological and Pharmaceutical Sciences 26 (1), 315-327, 2024*
5. *The combined efficacy of neem (Azardirachta indica) seed oil and orange (Citrus sinensis) peel oil cream as a mosquito repellent Godfred Yaw Boanyah, Ruth Carre Brenyah GSC Advanced Research and Reviews 12 (1), 057-067, 2022*

Cite This Article:

Gupta K.V. (2025). *The Comprehensive Study of Mosquito Repellent by Using Orange Peel.* **In Aarhat Multidisciplinary International Education Research Journal**: Vol. XIV (Number I, pp. 82–86).