Review on Mosquito Repellent Incense Sticks Using Herbs

Ms. Khose Sonali [1], Ms. Kasar Poonam [2], Ms. Shinde Ankita[3], Ms. Navale Dnyaneshwari[4]

Samarth Institute of Pharmacy Belhe Tal-Junnar Dist.-Pune Pin-412410 Maharashtra INDIA.

Abstract

Whenever there is a climate change this leads to expand the occurrence of various vector borne disease like malaria and dengue. Worldwide, Malaria is the one of the most major health related issues. The mostly affected group consists of young children and pregnant women. In 87 nations and territories, nearly half of the world's population dwells is place where malaria transmission is at risk. One of the important methods for limiting the spread of transmissible disease is mosquito control and personal protection from mosquito bites. The market is currently saturated with chemical- based mosquito repellents products. Which are not only more expensive but also more dangerous to the human body. In this paper an effort has make to develop economically affordable herbal mosquito repellent sticks comprised entirely of herbal ingredients. Since ingredients used were almost herbal hence it has low side effects on inhalation.

Keyword: Herbal plants against the Mosquito Bite, Different types of Incense Sticks in India, Different types of Incense Sticks, Herbs Used in Incense Preparation, Benefits of Using Incense Sticks, Uses of Incense Sticks.

Introduction:

In today's era the major concern is the change in the environment. The level of constant pollution has drawn the attention of the population. For the survival of human in this planet, the basic need is a clean environment.[1, 2] Presence of microbes in the air is the primary cause of many airborne diseases. Pathogens that are responsible for air borne diseases spread through air from infected person to non-infected one through the act of talking, laughing coughing, and sneezing. Nowadays, for having clean air to breathe many approaches are implemented to cleanse it. For the same many chemical alternatives are available in the market, but they do have many unwanted effects that can hamper the health of organisms. [3, 4] to counteract the unwanted effects of chemicals, herbal products can be taken as an alternative. Herbal products impart properties like fragrance as well as it induces a sense of positivity in the area it is used in addition to serve the purpose of cleansing the air. The current work basically focuses on elaborating the process of development of sticks, which can be used as an alternative to chemicals for decreasing microbial load in the air. For the preparation of the sticks all the basic ingredients that are required, are natural. The ingredient includes Orange peel extract, Neem powder, Tulsi Powder, Ghee, Cow milk, Lemongrass oil. Orange peel extract has always been used as a disinfectant from ages. [5–8] in many religions while performing practices like home or havens , ingredients like cow dung, camphor, urine of cow, cow ghee are used that helps in cleansing the environment and impart a feeling of pleasantness. [9–13] This sticks having pharmacopoeial quality can be made from cow product and plant powder and it imparts pleasant smell. These sticks can act as a disinfectant for the air in areas like home, hospitals and washroom. [14–17] Moreover incense sticks can also be formulated from ingredients such as bark, woods, essential oil and gums. Malaria is a parasitic life-threatening disease caused by bite of female Anopheles mosquitoes. There are 5 parasite species that cause malaria

infection out of these 2 species have greater threat - P. falciparum and P. Vivax. With the rise in the number of mosquito-borne diseases, controlling of mosquitoes gaining vital importance in human's daily life.[15] To combat rising number of mosquitoes, various solutions like mosquito repellent products are commercially available. Chemical based products are widely used to control the mosquitoes, but due to its synthetic components they are still toxic to human body. Due to toxicity issues there is increase in demand of development of herbal based mosquito repellent in the market. [8, 19] Natural herbal mosquito repellents are non-toxic, effective, eco-friendly, biodegradable cheap and prepared. The natural ingredients were used to make an herbal mosquito repellent sticks; essential oil obtained from lemongrass leaves, camphor, Neem leaves and tulsi powder and Ghee and Cow milk used as binding agent. This formulation was evaluated for appearance, efficiency and safety.[15]

2. Herbal plants against the Mosquito Bite:

Effectiveness of plant- based repellents against different Anopheles species.

Plant – based repellents have been applied for generations in traditional practice as a personal protection approach against different species of Anopheles. Knowledge of traditional repellent plants is a significant resource for the development of new natural products as an alternative to chemical repellents. Many studies have reported evidence of repellent activities of plant extracts or essential oils against malaria vectors worldwide. This work aimed to assess the effectiveness of plant- based repellents against Anopheles mosquitoes. The highest repellency effect was identified from Ligusticum Sinensis extract, followed by citronella, pine, peppermint oils. Furthermore, essential oils from plant such as lavender, camphor, catnip, geranium, jasmine, broad- leaved eucalyptus, lemongrass, cinnamon oil, soya bean, rosemary, olive, sandalwood and curcuma longa also showed good repellency with 8 Hrs. complete repellency against different species of Anopheles. Essential oils and extracts of some plants could be formulated for the development of eco-friendly repellents against Anopheles species. Plant oils may serve as suitable alternatives to synthetic repellents in the future as they are relatively safe, inexpensive, and are readily available in many parts of the world.

3. Different types of Incense Sticks in India:

3.1. Incense

Traditionally India has been using incense in many occasions which may be of social importance or religious importance. 40 In India incense sticks are referred as agarbatti. Agarbatti is form of incense where bamboo stick holds the incense paste around it. India was first to start preparing incense in a uniform system. In modern system of incense making, medicinal priest performs the responsibility of making incense. In many places of the world a belief system is quite prevalent that burning incense imparts mystical power of healing.

3.2. Types of incense:

There are different types of incense which shows different healing property. Below are few types of incense sticks are mentioned.

1. Dragon's Blood Incense - This incense helps in relieving in conditions like raging fevers, pain of ulcer, stomach virus symptoms, diarrhea etc.
2. Lavender Incense - It provides soothing and calming experience. It is helpful to get relief after a busy stressful day.
3. Sandalwood Incense - It reduces anxiety and induces feeling of spirituality in an individual.
4. Indian Cedar Incense - Helps in recovering from mood disorders and depression.
5. Amber Incense– the various systems of a body is balanced.
6. Patchouli Incense– soothes the nerves and makes them stronger.

4. Herbs Used in Incense Preparation:

As per previously conducted study, the essential oil of the leaves like Cymbopogon citratus (Lemongrass). Herbs like Ocimum sanctum (Tulsi), Curcuma longa (Turmeric), Azadirachta Indica (Neem), Citrus Aurantium (Bitter Orange) peels have shown effective mosquito repellent action. The powder of Azadirachta Indica (Neem) leaves has the property of mosquito repellents as well as helps in cleaning the atmosphere.

Fig.1: Citrus Aurantium (Bitter Orange Peels)

Table 1: Plant Profile:

Synonyms	Orange Cortex
Biological Source	Orange peels is dried or fresh outer part of the pericarp of the ripe or nearly ripe fruits of Citrus Aurantium Linn.
Family	Rutaceae
Chemical Constituents	Orange peels contains about 2.3% of volatile oil, it also contain several other compounds like hesperidin, iso- hesperidine, Vitamin. C and pectin**.**
Uses	Orange peels are used as stomachic, aromatic and carminative. Orange peel is natural insect repellent.

Fig.2: Azadirachta Indica (Neem)

Synonyms	Margosa
Biological Source	It consists of all aerial parts of plant Known as Azadirachta Indica.
Family	Meliaceae
Chemical Constituents	Nimbin, Nimbinene, Nimocinol, Quercetin
Uses	Which have insect repellent, insecticide, nematicide and antimicrobial.

Table.2: Plant Profile

Fig.3: Ocimum sanctum (Tulsi)

Synonyms	Sacred basil, Holy basil
Biological Source	Tulsi consists of fresh and dried leaves of Ocimum sanctum Linn.
Family	Lamiaceae
Chemical Constituents	It contain approximately 70% eugenol, methyl eugenol, Carvacrol (3%) and eugenol-methyl-ether (20%)
Uses	The oil is used for antibacterial and insecticidal.

Table 3: Plant Profile

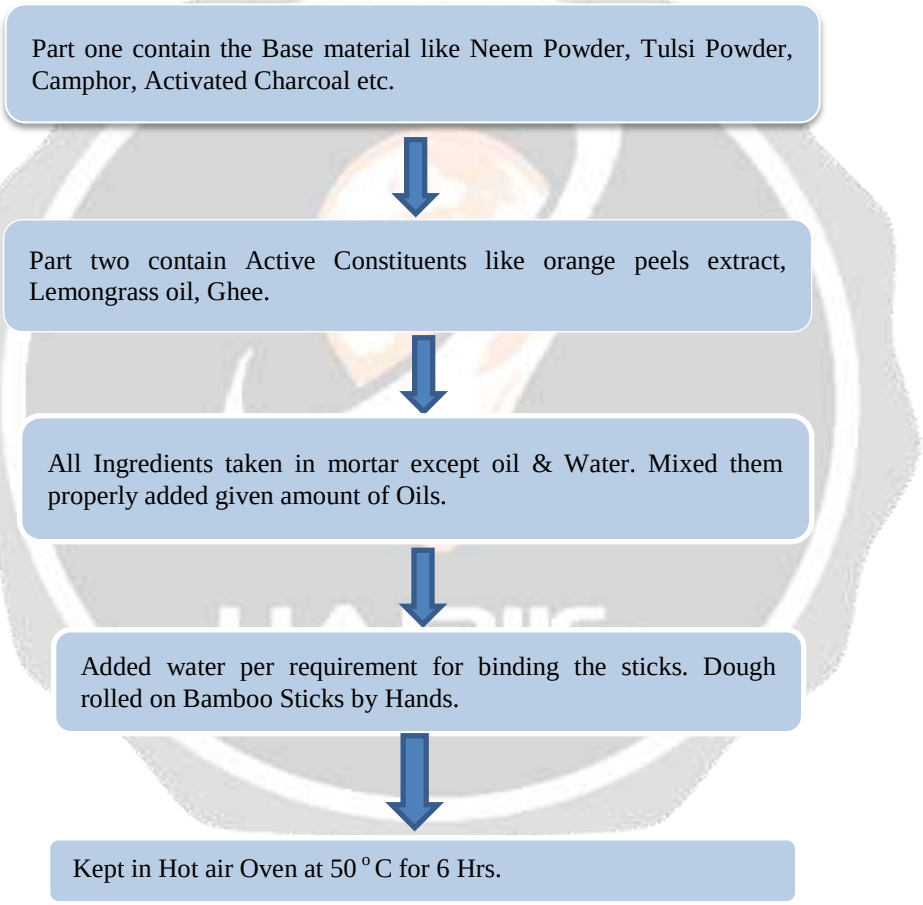
Fig.4: Cymbopogon citratus (Lemongrass)

Synonyms	Citronella grass
Biological Source	Lemongrass oil is obtained from Cymbopogon citratus stapf belonging to family Poaceae
Family	Poaceae
Chemical Constituents	Citronella , geraniol, citronellol
Uses	These species are used for the production of citronella oil, which is used in soaps as an insect repellent (especially mosquitoes and houseflies) in insect sprays and candles.

Table.4: Plant Profile

5. Method of Preparation of Incense Sticks:

Mosquito repellent stick have mainly two parts of the Ingredients



6. Benefits of Using Incense Sticks

1. Incense Sticks imparts benefits to body, mind and soul. Dhoop incense is known to improve concentration that can help us while studying, doing meditation and it also prevents infections, relieves headaches, fights depression, and reduces anxiety and tension.
2. Incense sticks due to its soothing fragrances helps in calming the mind as well as creates a peaceful atmosphere around.
3. The resins and herbs used in preparation of Incense sticks, are having beneficial effects on patients of asthma, bronchitis and cold.

7. Uses of Incense Sticks

7.1. Antimicrobial

Incense Sticks are known to impart antimicrobial activity. Antimicrobial are referred to the agents which has the ability to either kill or stop the growth of microbes. Antimicrobial medicines are classifies based the microorganisms they act on. For example, antibiotics are used against bacteria and antifungals are used against fungi. Antimicrobials are also classified according to their function. Agents capable of killing the micro-organism are termed as microbicidal, and others who stop their growth are known as biostatic. As incenses are prepared from many herbs that have microbial property, so it imparts anti-microbial activity.

7.2 Mosquito Repellent

Mosquitoes are one the major vectors of many deadly diseases. A mosquito sucks the blood from human beings and in turn causes disease in them. Several mosquito species belonging to genera Anopheles, Culex and Aedes are vectors for the pathogens of various diseases like Dengue fever, Malaria, Yellow fever and several other infections. Incense Sticks with mosquito repellant property can help in acting on this vector and impart relieve to human beings.

8. Conclusion

As air borne diseases are quite prevalent now a days so there is a need to have air with low microbial load to reduce the incident of air borne diseases. Presently many chemical alternatives are used to deal with the situation, but they also impart many side effects. In present scenario Incense Sticks with antimicrobial property can act as a savior. Moreover in countries like India, where most of our functions and social gathering start with lighting a dhoop or incense stick, it can perform dual functions. Additionally, the cost to prepare Incense Sticks is quite economical and can be bear by anyone so it can be a better option against the costly chemical alternatives. Present work tries to conclude that if a focused approach is taken towards manufacturing of Incense Sticks by using natural ingredient then it can be a potential market in future.

9. Acknowledgement

We thank and gratitude to Trustee of Samarth Rural Educational Institute's and team of Samarth Institute of Pharmcy, Belhe, Pune with their valuable guidance and support. For most, I offer my deep sense of gratitude to my respected guide, Prof. Poonam Kasar, for her valuable guidance, support and encouragement.

10. Refrences

[1] .Brown, M. and Hebert, A.A, "Insect repellents: an overview". Journal of the American Academy of Dermatology, vol. 36, issue 2, pp.243-249, 1997.
[2]. Fradin, M. S., "Mosquitoes and mosquito repellents: a clinician's guide", Annals of internal medicine, vol.128, issue 11, pp. 931-940, 1998.
[3]. Bhat, S., & Aravind, G. "Evolution, Current Status and Prospects of Phyto-Repellents against Mosquitoes". International Journal of Pharmacology Photochemistry and Ethnomedicine, vol. 8, pp. 54-73, 2017.
[4]. Kantheti, P., Alapati, P., & Sulthana, S. K. "Traditional medicinal Practices for mosquito repellency by tribes of west central India: An overview", Journal of Pharmacognosy and Phytochemistry, vol.7, issue 2, pp.2755-2759, 2018.
[5]. Mukherjee, G., & Ghosh, S. "Use of Cow Dung as Mosquito Repellant", International Research Journal of Pharmacy and Medical Sciences, vol.3, issue 1,pp. 61-62, 2020.
[6]. Trivedi, A., Rai, P., Kumar, J., and Trivedi, C.A. "Formulation of low smoke herbal mosquito repellent sticks by using different essential oils", The Pharma Innovation Journal, vol.7,issue 4, pp. 173-175, 2018.
[7]. Sukhdeep Kaur, "Preparation and Applications of Anti-Mosquito Herbal Dhoopwati by using Mosquito Repellent Plants", Bulletin of Pure and Applied Sciences, Botany, vol.41, issue 1, pp. 66-70, 2022.
[8]. Sharma, M., Alexander, A., Saraf, S., Saraf, S., Vishwakarma, U. K., & Nakhate, K. T. "Mosquito repellent and larvicidal perspectives of weeds Lantana camara L. and Ocimum gratissimum L. found in central India", Biocatalysis and Agricultural Biotechnology, vol. 34, pp.102-240, 2021.
[9]. Bahadur, A., Chandrasekhar, K. S., & Pai, V., "Formulation and development of polyherbal mosquito repellent incense sticks", Research Journal of Pharmacy and Technology, vol. 13, issue1, pp. 124-128,2020.

[10]. Shibin, A., Kumar, M. S., & Valarmathi, S. "Comparatives Study of Formulated Herbal Mosquito Repellent Incense Sticks with Market Product", Journal of Pharmaceutical Research International, pp.128-132, 2021.
[11]. Kaur, S., Kumar, M., Sharma, P., Sharma, I., Upadhyay, S. K., & Singh, R. "Preparation and applications of anti-mosquito herbal dhoopwati by using mosquito repellent plants", Bulletin of Pure & Applied Sciences Botany, vol. 41, issue1, pp.66-70, 2022
[12]. O. Oyedele, A. A. Gbolade, M. B. Sosan, F. B. Adewoyin, O. L. Soyelu, and O. O. Orafidiya, "Formulation of an effective mosquito-repellent topical product from lemongrass oil," Phytomedicine, vol. 9, 2002. p. 259–262.
[13]. U. Sakulku, O. Nuchuchua, N. Uawongyart, S. Puttipipatkhachorn, A. Soottitantawat, and U. Ruktanonchai, "Characterization and mosquito repellent activity of citronella oil nanoemulsion," International Journal of Pharmaceutics, vol. 372, no. 1-2, 2009.p. 105–111,
[14]. Y. G. Gillij, R. M. Gleiser, and J. A. Zygadlo, "Mosquito repellent activity of essential oils of aromatic plants growing in Argentina," Bioresource Technology, vol. 99, no. 7, 2008 p. 2507 2515.
[15]. "How products are made: mosquito repellent," 2013, http://www.madehow.com/Volume-3/Mosquito-Repellent.html.
[16]. Brookfield CT3 Texture Analyzer Operating Instruction Manual No. M/08-371A0708, Brookfield Engineering Laboratories, Middleborough, Mass, USA, 2011.
[17]. OECD, Test No. 404: Acute Dermal Irritation/Corrosion, OECD, 2002.
[18]. Z. Kojic, D. Stojanovic, S. Popadic, M. Jokanovic, and D. Janackovic, "The irritative property of α-tricalcium phosphate to the rabbit skin," General Physiology and Biophysics, 2009. vol. 28, p. 168–173.
[19]. J. H. Draize, G. Woodard, and H. O. Calvery, "Methods for the study of irritation and toxicity of substances applied topically to the skin and mucous membranes," Journal of Pharmacology and Experimental Therapeutics, vol. 8, 1944. p. 377–390.
[20]. D. B. Aime, S. D. Arntfield, L. J. Malcolmson, and D. Ryland, "Textural analysis of fat reduced vanilla ice cream products," Food Research International,2001. vol. 34, no. 2-3, p. 237–246.