

## DEVELOPMENT OF HERBAL MOSQUITO REPELLENT INCENSE STICK- AN OBSERVATIONAL STUDY

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### ABSTRACT

Vectors are living organisms that can transmit infectious diseases between humans or from animals to humans. Mosquitoes are the best known disease vector. Many mosquito repellents are available in the market in various forms such as coils, mats, sprays and fast card etc. which have prevented countless cases of vector borne diseases but potential adverse health effects also have been reported. *Haridra, Nimba, Vidanga, Maricha and Chandana* have been explained as retaining *Jantughna* and *Krimighna* property in the classical texts of *Ayurveda*. Hence an attempt was made here to develop a safe and potent herbal incense stick using *Haridra, Nimba, Vidanga, Maricha and Chandana* with better duration of time and cost effective.

**KEYWORDS:** Herbal, Mosquito repellent, Incense stick

### INTRODUCTION

Vector borne diseases account for more than 17% of all infectious disease, causing more than 7 lakhs deaths annually.<sup>1</sup> Mosquitoes are best known disease vector. Many diseases such as Chikungunya, Dengue fever, Malaria, Lymphatic filariasis, Rift valley fever, Yellow fever, Zika are caused by these mosquitoes. India reported 250 deaths due to mosquito borne disease among 1, 57,220 cases of dengue during 2017. The data showed that 62,268 cases of chikungunya were reported in the country wherein the highest numbers with 31,644 cases were reported from Karnataka<sup>2</sup>. Many mosquito repellents are available in the market in various forms but these repellents contain chemical and are hazardous to the

health and causes respiratory disorders.<sup>3</sup> *Haridra, Nimba, Vidanga, Maricha and Chandana* retain the *Jantughna* and *Krimighna* property. Usually in the olden days *dhupana* was used as the media as mosquito repellent and by keeping this into consideration, an effort is made to develop an incense stick which contains various herbal drugs which acts as mosquito repellent. Incense stick which is prepared out of above ingredients is eco-friendly, portable, cost effective and comparatively having nil untoward health effect as compared to other repellents available in the market.

**Concept of Dhupana:** Agni, the Lord of Fire, blessed sages with unique technique of fumigation to get rid of *Rakshasa*, which can be considered as air borne vectors which are

invisible to naked eyes<sup>4</sup>. There are three types of fumigations, on the basis of action, i.e. *Dhupa* (Fumigation) *Anudhupa* (Subsequent Fumigation) and *Pratidhupa* (Anti-fumigation). *Dhupana* is useful to prevent disease by disinfection of desired place.<sup>5</sup>

## MATERIALS AND METHODS

Materials:

Base – Saw dust – 50gms.

Adhesive gum base- 100gms

Ingredients-

S N	Herbs	Latin Name/Family	Part Used	Quantity
1	<i>Nimba</i>	<i>Azadiracta indica/ Meliaceae</i>	Leaves	50 g
2	<i>Haridra</i>	<i>Curcuma longa/ Zingiberaceae</i>	Rhizome	50 g
3	<i>Maricha</i>	<i>Piper nigrum/Piperaceae</i>	Seeds	50 g
4	<i>Chandana</i>	<i>Santalum album/Santalaceae</i>	Heartwood	50 g
5	<i>Vidanga</i>	<i>Embelia ribes/Myrsinaceae</i>	Fruit	50 g

Processing materials:

- 1) Sieve
- 2) Weighing machine
- 3) Uncoated incense Sticks

Methodology:

1. Herbal drugs having *Jantughna* and *Krumighna* properties were selected from *Dhanawantari Nighantu*.
2. Drugs were authenticated at BVVS Ayurved Pharmacy.
3. *Sukshma churnas* of the above ingredients were prepared at BVVS Ayurved Pharmacy.
4. Preparation of Incense stick was done at Ravikant Agarbatti Small Scale Industry, Bagalkot-Karnataka.

### Preparation:

1. *Sukshma choorna* of all the above ingredients were made separately and mixed to form a homogenous mixture.
2. This mixture was mixed along with saw dust and adhesive gum and was blended properly.
3. This blended mixture when homogeneously mixed was added to the instrument which coats the uncoated sticks with the blended mixture.

4. The obtained incense sticks were smeared with the dry saw dust and was allowed to dry and placed in the inert glass containers.

### OBSERVATIONS

Prepared incense sticks along with the feedback checklist were distributed among 40 houses which were randomly selected in a colony of Navanagar in Bagalkot and the feedback of the product pertaining to its efficacy, duration of time, ill effects or any allergic reactions was collected. Testing of mosquito repellent stick was done at 40 different places (having area 100-150 sq ft) in regard to the time taken by stick for burning, fragrance of the stick while burning, duration of repellent effect and any adverse effects in terms of symptoms and the feedback was collected. Repellent in the form of incense stick, its colour and length was appreciated by all the forty individuals. The complete stick burnt in 8-10 minutes. The stick had mosquito repellent action when compared with other repellents. Fragrance of sandalwood was appreciated in the initial 2 minutes of stick burning. Duration of mosquito repellent effect even after

ventilation i.e. opening windows was 2 to 3 hours.

### Properties of Drugs Selected:

*Nimba*<sup>6</sup>: 'Pittajwara atisaaragnitrushna *krimi Vinashini*.'

*Haridra*<sup>7</sup>: 'Vishodhini *krimihara peenasa aruchinaashini*'.

*Vidanga*<sup>8</sup>: 'Eeshattiktam vishaan hanta vidangam *kriminashanam*.'

*Maricha*<sup>9</sup>: 'Vayumnivarayateva *jantusantana naashanam*.'

*Chandana*<sup>10</sup>: 'Pittasra vishatudaha *krimighnam guru rukshanam*.'

### DISCUSSION

Significantly there will be reduction in air borne diseases due to the smoke produced by the incense stick which contains herbal drugs where the chemical compositions of these drugs have been shown the germicidal effects. Repellents available in market comprises of toxic material which have an ill effect on the health of a person. The smoke and fumes produced by these herbal drugs acts as germicidal and thereby do not produce toxic complications to the people around. Incense sticks prepared is cost effective, easily portable and more aesthetic in comparison with chemical fumigation methods. Incense sticks prepared out of herbs have showed good mosquito repellent property. Hence, it is very safe to use and are non-toxic in nature. One can use these sticks for regular repellent in houses and laboratories.

### CONCLUSION

The Incense stick prepared using above drugs showed mosquito repellent action and also nil untoward effects. It can be concluded that the incense stick prepared was eco-friendly, cost effective and safe to

use. It is easily portable and can be easily used by all age groups.

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Ingredients



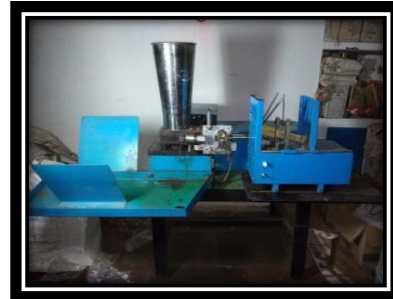
Adhesive gum



Saw dust



Herbs with saw dust mixture



Instrument used for the preparation of stick



Prepared incense sticks



Burning incense stick