DEVELOPMENT OF HERBAL MOSQUITO REPELLENT INCENSE STICK- AN OBSERVATIONAL STUDY

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INTRODUCTION

Vector borne diseases account for more than 17% of all infectious disease, causing more than 7 lakhs deaths annually1. Many 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 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

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 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.

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invisible to naked eyes. 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.

**MATERIALS AND METHODS**

**Materials:**
- Base – Saw dust – 50gms.
- Adhesive gum base - 100gms

**Ingredients:**

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

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 homogenously 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: ‘Pittajwara atisaaragnitrushna krimi Vinashini.’
Haridra: ‘Vishodhini krimihara peenas aruchinaashini’.
Vidanga: ‘Eeshattiktam vishaan hanta vidangam kriminashanam.’
Maricha: ‘Vayumnivarayateva jantusantana naashanam.’
Chandana: ‘Pittasra vishatudaha krimignham 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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