



Development And Evaluation Of Efficacy Of Herbal Mosquito Repellent Fast Card

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Abstract: The vector born diseases are increasing in the society. The mosquitoes are commonest amongst them. Many types of mosquito repellents are available. The instant cards prepared from the Ayurvedic herbs like Nirgudi, Nimbi, Tulsi, Haridr, Karpoor, Bhutrun. Effects were noted shows mosquito repellent activity with minimum cost and better duration of time.

Key words: herbal mosquito repellent, fast card, Nirgudi, Nimbi, Tulsi, Haridr, Karpoor, Bhutrun.

Development and evaluation of efficacy of Herbal Mosquito Repellent Fast Card

Diseases like dengue, malaria, chickungunya have spread a havoc in the society since last 3-4 years (More than 3361 deaths from 2010-2013¹. Vectors like *Aedesaegypti* are the transmitters of these diseases². People from every strata of society are affected due to such diseases, from politicians to celebrities (e.g. Yash Chopra died of Dengue).

One of the ways to protect ourselves from such diseases is protection from mosquitoes. The present mosquito repellents are slow acting and contain chemicals which are hazardous to health are declared as toxic. So, preparation of herbal mosquito repellent would be an eco-friendly and non hazardous way to protect ourselves from mosquitoes.

Aim –

To develop and evaluate the efficacy of herbal mosquito repellent FastCard.

Objectives –

1. To select the drugs and study their mosquito repellent property.
2. To develop mosquito repellent Fast Card using extracts of herbal drugs.
3. To test the efficacy of the Fast Card.

Materials –

1. **Base** – Handmade paper (400 GSM)
2. **Herbal products** –
 - 1) *Nirgundi* – *Vitex negundo*³
 - 2) *Nimb* – *Azadiracta indica*⁴

- 3) Tulasi – *Ocimum sanctum*⁵
- 4) Haridra – *Curcuma longa*⁶
- 5) Karpoor – *Cinnamomumcamphora*⁷
- 6) Bhutrun – *Cymbopogon citratus*⁸

3. Processing materials –

- 1) Food processor
- 2) Sieve
- 3) Paint brush
- 4) Weighing machines
- 5) Measuring cylinder

Methodology –

- i. Herbal drugs having *Vishaghna* and *Krumighna* properties were selected from Ayurved Samhitas. Criteria for selection of dravyas-
 - From *Vishaaghna* and *Krumighnagana* of Charak samhita¹⁵
 - Study of each particular dravya from *Bhavprakash Nighantu* with respect to *Krumighna* properties.
 - Availability of *Dravya*
 - Cost effectivity.
 - Research published for mosquito repellent activity of above *Dravyas*.
- ii. Authentication of the above herbal drugs were done at Dravyaguna department of R.S.M's Tilak Ayurved Mahavidyalaya Pune .
- iii. Herbs were collected and sorted.
- iv. Extract was prepared from –
 - 1) Nimb , Nirgundi , Tulasi and Bhutrun in liquid form (*swaras*)
 - 2) Haridra , Karpoor in powder form (*churna*)

Textual References Of Selected Drugs- The literature was searched and following herbs were identified which shows *jantugna*, *krumighna* (insecticidal) property.

- 1) *Nirgudi*- *Sinduwardalam jantu vatashleshmaharam laghu*⁹
- 2) *Nimb*- *Nimb patramsmrutamnetryam krumi pitta visha pranut*¹⁰
- 3) *Tulasi*- *Hikkakasa visha shwasparshwashool vinashanah*¹¹
- 4) *Haridra*- *Haridraturasetiktarukshoshna visha kushthanut*¹²
- 5) *Karpoor*- *Trutmedo vishadoshaghnam chakshushyammada karakam*¹³
- 6) *Bhutrun*-The oil of *Cymbopogon citratus* is known to repel mosquitoes¹⁴

- v. Extracts of all components was mixed and preparation of solution having consistency of thin liquid paste was done.
- vi. The prepared solution is applied on different papers of different thickness and textures and pieces of various types of clothes.

Methods used for applying solution are as follows–

- 1) Applying the mixture using a paintbrush
- 2) Spraying the mixture on handmade paper.
- 3) Dipping paper /cloth in the solution

- vii. The solution was applied on the paper, cloth variable times and was tested for burning, efficacy and cost effectivity.
- viii. Finally application of solution on handmade paper (400 GSM) of colour creamy white proved to be most beneficial.
- ix. Paper was dried overnight.
- x. It was burnt for testing efficacy after one , three , five and seven applications of the solution prepared.
- xi. Most efficacious product was obtained when ,the solution was applied 6 times on both sides and bhutrun oil was added to solution during the 7th application .
- xii. The strip was cut into cards of equal size measuring 5cm × 7cm .
- xiii. Testing of mosquito repellent Fast Card was done at 30 different places (having area 100-150 sq ft). The area was closed. Windows were closed.

Observation –

Observations from 30 different places was noted, The feed back of the sample was taken which indicates. Size of card was appreciated by all thirty individuals. Colour of the card was appreciated by all thirty individuals. The card was inflamed very easily. All cards were ignited easily in 2-3 seconds. Time of burning - card was 5cm × 7cm. it takes 5 to 6 min for complete burning. Approximately 5-8 percent of the paper remains unburned. The smell after burning was pleasant and was appreciated by the all thirty individuals. Mosquito repellent effect was noted by all the thirty individuals. No adverse effect in terms of symptoms was observed. Duration of mosquito repellent effect even after ventilation i.e. pening windows was 1.30min to 2 hours.

Discussions-

Mosquito repellents are of different types. Nets, coils and mosquito repellent liquids are more commonly used. They have their advantages and disadvantages¹⁶ mosquito repellent action being advantage, The pollutants characterized included fine and ultrafine particles, polycyclic aromatic hydrocarbons (PAHs), VOCs, and aldehydes, and ketones with high irritation or suspected carcinogenic effects. all particles emitted from burning mosquito coils¹⁶ were fine, < 1 µm in diameter. The herbal card not yet checked but may not be that hazardous as coils with charcoal powder¹⁷ as base material reduces fine particle emissions by a factor of 5-10 and also reduces emissions of pollutants such as formaldehyde and PAHs substantially. Material used in the in card are herbs in form of juice and hand made paper this may produce similar effects. The duration of exposure to the card fumes is less, card fumes are also less.

Conclusion –

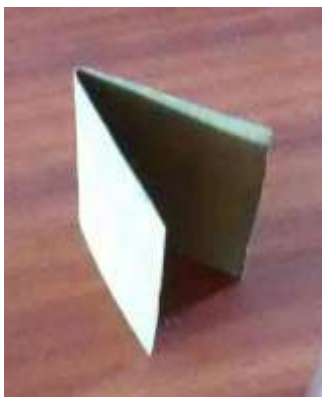
The Fast Card prepared using above drugs , proved beneficial, safer, cheap and better way to repel mosquitoes. The prepared mosquito repellent fast card is eco friendly. It has long lasting effect, Fast acting, Portable and comparatively safe.

References –

- 1) Preventive and social medicine;Dr.K.Park(23rd edition) pg no.246 , 250
- 2) Preventive and social medicine;Dr.K.Park(23rd edition) pg no.246
- 3) Bhavprakash Nighantu;Chunekartika;ChaukhambaPrakashan,pg no.329
- 4) Bhavprakash Nighantu;Chunekartika;ChaukhambaPrakashan,pg no.314

- 5) Bhavprakash Nighantu;Chunekartika;ChaukhambaPrakashan,pg no.496
- 6) Bhavprakash Nighantu; Chunekartika;ChaukhambaPrakashan,pg no.111
- 7) Dravyaguna Vidnyan;Vd.V.M.Gogate;VaidyamisraPrakashan;pg. no.306
- 8) Bhavprakash Nighantu;Chunekartika;ChaukhambaPrakashan,pg no.370
- 9) Bhavprakash Nighantu;Chunekartika;ChaukhambaPrakashan,pg no.329
- 10) Bhavprakash Nighantu;Chunekartika;ChaukhambaPrakashan,pg no.314
- 11) Charak Samhita Sutrasthan Adhyay 27 ChaukhambaPrakashanpg no.162
- 12) Bhavprakash Nighantu;Chunekartika;ChaukhambaPrakashan,pg no.111
- 13) Dravyaguna Vidnyan;Vd.V.M.Gogate;VaidyamisraPrakashan;pg. no.308
- 14) W.R.I. Masamba, J.F.M.Kamanula,ElizabethM.T.Henry and G.K.C.Nyirenda; Malawi Journal of Agricultural Sciences,2003
- 15)Charak Samhita Sutrasthan Adhyay 4 Chaukhamba Prakashan pg no.33
- 16) Weili Liu, et al., Mosquito coil emissions and health implications. Environ Health Perspect. 2003 Sep; 111(12): 1454–1460, PMID: PMC1241646
- 17)Zhang L1, Jiang Z, Using charcoal as base material reduces mosquito coil emissions of toxins. Indoor Air. 2010 Apr;20(2):176-84. doi: 10.1111/j.1600-0668.2009.00639.x

In process : solution applied on the strip of handmade paper seven times.



Fast Card



During burning



After burning