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Development and Evaluation of Herbal Mosquito Incense Repellant Stick

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ABSTRACT:

In this work, garlic leaves and holly basil were used to prepare and develop polyherbal mosquito repellent incense sticks. It is created two formulas, F1 and F2. Holy basil is the only herb used in the F1 formulation, while holy basil, garlic, and other herbs are used in the F2 formulation. The developed formulation's ability to repel mosquitoes was compared and its effectiveness assessed.

Key word: Mosquito repllent sticks, holybasil leaves, Garlic

Introduction:

Mosquitoes are among the most disturbing blood sucking insects afflicting human beings. Several mosquito species belonging to genera Anopheles, Culex and Aedesare vectors for the pathogens of various diseases like Dengue fever, Malaria, Yellow fever, Japanese Encephalitis and several other infections. Mosquitoes alone transmit diseases to more than 700 million people and over one million deaths are reported annually across the globe[1]. Therefore, the control of mosquitoes is an important public health concern around the world. As most of the mosquito repellent products and devices available in the market are reported to have harmful effects on human beings, the objective of the present study is to develop effective plant-based mosquito repellent products[2]. A mosquito repellent is a substance applied to skin, clothing or other surfaces which discourages mosquitoes from landing or climbing on that surface.[3] Usually, mosquito repellents work by masking human scent or by using a scent which mosquitoes naturally avoid.[3,4] Carbon dioxide and lactic acid present in sweat in warm-blooded animals act as an attractive substance for mosquitoes

Perception of the odour is through chemo-receptors which are present in the antennae of mosquitoes. [5] The repellents block the lactic acid receptors and destroy upwind flight. According to the past researches, the essential oils of the leaves of Cymbopogonnardus (Citronella), [6]Cymbopogoncitrates (Lemongrass), [7]Cymbopogonwinterianus (Citronella), [8] Ocimumbasilicum (Sweet Basil), [2]Ocimum sanctum (Tulsi), [9]Ocimumamer-icairy Basil), [14] Eucalyptus citriodora (Eucalyptus), [10] Eucalyptus globulul (Eucalyptus), [16]Rosmarinusofficinalis, [17] Melissa officinalis, [12] Curcuma longa (Turmeric) rhizomes,[18] Citrus sinensis (Sweet Orange) peels,[2] Citrus hystrix (Kaffir Lime) peels,[19] Citrus limonum (Lemon) peels, [8] Syzygiumaromaticum (Clove) buds1and Pinusroxburghii resins have shown very high mosquito repellent activity. Moreover, the extracts of Azadirachtaindica (Neem) seeds, [20] leaves of Alpinia galangal (Greater Galingale), [18]Vitexnegundo (S. Nika)[21] and Tribulusterrestris (S. Gokatu) also have been studied as possible mosquito repellents. The selection of these plants was based on their availability as raw materials, scientific evidence and folkloric use as mosquito repellents.

MATERIAL METHODS

For prepration of herbal mosquito repellent Dhoop, the dried tulsi leaves (7.05%), bay leaf (8.40%) and neem leaves (11.22%) were mixed with loban (5.32%), maida (5.63%) clove(1.98%) and saw dust (6.38%), After mixing, dried cow dung (42%) and camphor (2.14%) were added in above mixed material. Half of all essential oils used in formula were added (eucalyptus essential oil (1.57%) peppermint essential oil (1.15%) lemongrass essential oil (2.22%)). At the end small quantity of water was added to improve binding capacity of maida and Above mixture converted into desired shape of Dhoop using mould and was allowed to dry by placing exposed overnight. Finally remaining quantity of essential oils were sprayed on Dhoop and dried in hot air oven at 120°C for 15 minutes.

Formula 1:

Sr.No.	**Ingrediants**	Parts(percent)
01	Neem Leaves	11.22
02	Cow Dung	42

03	Lemongrass Oil	4.44
04	Saw Dust	6.38
05	Loban (Raal)	5.32
06	Mint Oil	2.30
07	Maida	5.63
08	Eucalyptus Oil	3.14
09	Camphor	2.14
10	Bay Leaf	6.40
11	Clove	1.98
12	Tulsi	6.05
13	Garlic Leaves	4

Table 1

Formula 2:

Sr. No.	Ingrediants	Parts(percent)
01	Neem Leaves	10.12
02	Cow Dung	45.0
03	Lemongrass Oil	3.08
04	Saw Dust	3.24
05	Loban (Raal)	4.22
06	Mint oil	3.08
07	Maida	6.12
08	Eucalyptus Oil	3.10
09	Camphor	2.25
10	Bay Leaf	12.0
11	Clove	1.60
12	Tulsi	3.15
13	Garlic leaves	3.04

Table 2

Comparative efficacy of two herbal mosquito repellent with time

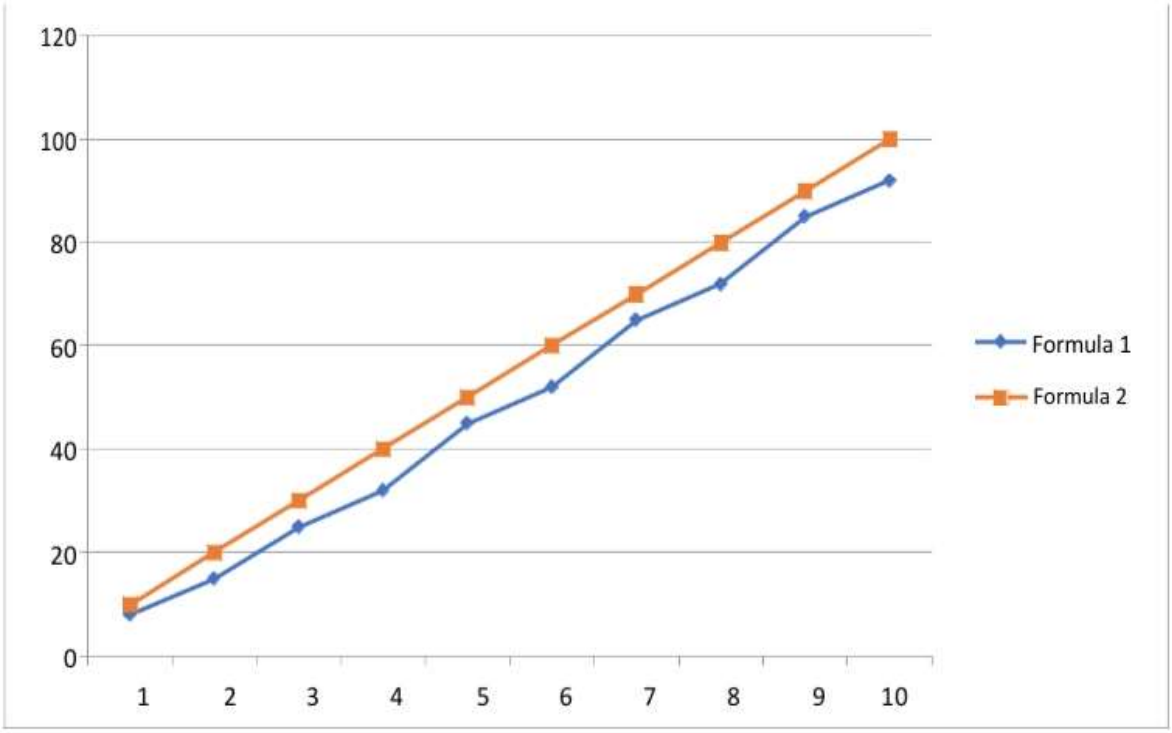

Fig. 1.1

EVALUATION OF MOSQUITO REPELLENT INCENSE STICK

BURNING ON USERS :

Test was done by simply selecting mosquitoes from areas in the evening and night period. The public remarks were noted down after allowing them to investigate mosquito repellent activity. The prepared incense sticks F1 and F2 were checked for casual effects such as irritation, coughing, and tears were observed and recorded.

SMOKE TOXICITY TEST:

Smoke toxicity test was conducted in a chamber measuring 34.5x24x0.95 cm. Then adult mosquitoes were released into the chamber and they were exposed to the smoke of burning incense sticks for 45 minutes. The mortality data were recorded after every 15 minutes. Total number of mosquitoes used was 25.

FEEDBACK FROM 20 VOLUNTEERS:

The feedback of mosquito repellent incense stick were taken from 20 people and requested to evaluate the formulation (F2) containing poly herbs.

RESULT AND DISCUSSION

Significantly there will be reduction in air borne disease due to the smoke produced by the incense stick which contains herbal drugs where the chemical composition 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.

Fig. 1.2

Mosquito repellent prepared with different quantity of ingredients was given for use to people of different colonies in Shahpur. The testing of both formulation conducted in a group of 30 people to check the mosquito repellent activity of both formulation. About 70% people found that formulation 2 is more helpful to repeal Mosquitoes than formulation 1 and just 30% people found formulation 2. To compare effectiveness of both formulation we used both formulation in different area and we also found that formulation2 is more effective than formulation1.

CONCLUSION

The incense stick made with the aforementioned medications demonstrated mosquito-repellent activity and had no negative side effects. Conclusion: The prepared incense stick was economical, safe, and environmentally beneficial. It is easily transportable and suitable for usage by people of all ages. Both formulations were shown to be highly effective at eliminating mosquitoes, however formulation 2 was more so. It might be because there are more bay leaves in there. This study led to the creation of a natural mosquito repellent that is risk-free for people and has no negative side effects. The study's findings also suggested that a mosquito repellent made from bay leaves would be effective in reducing mosquito populations.

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