

FORMULATION AND EVALUATION OF ZINGIBER MOSQUITO REPELLENT

Jahnvi. Thota*, B. Tejaswini, G. Manisha, M. Bharath Kumar, M. Santosh, N. Vyuhitha

K.G.R.L College of Pharmacy.



*Corresponding Author: Jahnvi. Thota

K.G.R.L College of Pharmacy.

Article Received on 13/02/2025

Article Revised on 05/03/2025

Article Accepted on 25/03/2025

ABSTRACT:

The formulation of evaluation of zingiber mosquito repellents aim to provide a natural and effective repellents alternative to synthesis irritant repellents. The study involves the development of herbal repellents using traditional herbal ingredients known for the effect on mosquitos such as zinger, clove, neem, turmeric, cinnamon powder. The formulated mosquito repellent activity and non-irritant the Physiochemical analysis demonstrated promising results indicating the potential of the herbal mosquito repellents for maintaining the mosquito the surrounding there by reclearing the mosquito related diseases which showing effect on mosquitoes and maintain health without any irritation and adverse effects.

KEYWORDS: Mosquito Repellents, Natural Ingredients, Ginger powder, Cinnamon powder, Tulsi powder, Neem powder, Marigold powder, Sandalwood powder, Turmeric powder, Starch, Eucalyptus oil, Charcoal, Organoleptic test, Flammability test, Ash value test, Smoke toxicity test, Repellence test, Irritation test.

INTRODUCTION: (MOSQUITO REPELLENT)

Herbal mosquito repellents are natural repellents. Herbal mosquito repellent contains the Ginger and Turmeric which acts as a natural herbal mosquito repellent. It majorly offers an Anti -malarial properties with safety and efficacy. These are majorly made of plant-based ingredients and botanical extracts. Generally, mosquito repellents are used for make the surroundings unsuitable for mosquitos and make it against the mosquito related problems. It is safe, non-toxic, eco-friendly, pleasant, effective on mosquito. It is used to stop the transmission of diseases carried by vectors.

Use it daily to create mosquito free surroundings and avoid mosquito related problems and experience the fragrance of lavender oil while flaming. The female Anopheles mosquitos are responsible for transmission of pathogens and cause mosquito related problems. It may cause on life-threatening diseases such as Filariasis, Dengue fever, yellow fever, Chikungunya and other Arboviruses. They mainly transmit the diseases just by a bite on the skin and through saliva that pathogens get infected into the host. Mosquito mainly transmit diseases to more than 7 million people annually and results death of 1 out of 17 is alive.

Materials Used & their Effects:

- ✓ Ginger powder - Antimalarial
- ✓ Cinnamon powder – Antifungal

- ✓ Turmeric powder - Antiseptic
- ✓ Tulsi powder - Anti microbial properties
- ✓ Neem powder - Antibacterial
- ✓ Marigold powder - Anti inflammatory
- ✓ Sandalwood powder - Powerful insect repellent
- ✓ Starch - Good binding property
- ✓ Eucalyptus oil - Antifungal & Antiseptic
- ✓ Coconut oil – Emulsifiers
- ✓ Lavender oil – 94% protective against mosquitoes for 4hrs,
- ✓ Camphor – Antibacterial insecticide
- ✓ Cow dung powder – combustion.
- ✓ Peppermint oil – Effective repellent.
- ✓ Benzoin powder – Degassing agent

NOTE: All the above ingredients are tested for their usage and are determined safe.

METHODOLOGY

Take all the powders in a given quantity into a mortar & pestle and triturate to get a fine powder.



Sieve them by using #sieve no:60. Collect the powders into a Beaker.



Take another Beaker then take a given quantity of starch, charcoal & distilled water then boil the mixture.



Now add the solution into the powders by continuous stirring.



Add required quantity of Essential oils to the above mixture.



Make them into required size. Dry for 5 – 6 days under the sunlight.

Table:

S. No	Ingredients	Quantity taken	Uses
1	Ginger powder	3gm	Antimalarial
2	Cinnamon powder	2gm	Antifungal
3	Clove powder	2gm	Antioxidative
4	Neem powder	2gm	Antibacterial
5	Turmeric powder	1gm	Antiseptic
6	Tulasi powder	2gm	Antimicrobial
7	Marigold powder	1gm	Anti inflammatory
8	Sandalwood powder	1gm	Powerful insect repellent
9	Activated charcoal	1gm	An absorbent
10	Starch	2gm	Good binding property
11	Camphor	2gm	Antibacterial insecticide
12	Benzoin powder	2gm	Degassing agent
13	Water	10ml	Vehicle
14	Coconut oil	2ml	Emulsifiers
15	Peppermint oil	0.4ml	Effective repellent
16	Eucalyptus oil	0.5ml	Antifungal &Antiseptic
17	Lavender oil	0.25ml	94% Protection against mosquitoes for 4hr
18	Cow dung powder	1gm	Combustion

LIST OF INGREDIENTS



EVALUATION TESTS FOR ZINGIBER MOSQUITO REPELLENT

The evaluation of Zingiber a mosquito repellent includes physical parameters.

- 1) Physical Evaluation
- 2) Flammability Test
- 3) Moisture content test
- 4) Ash value test
- 5) Smoke toxicity test.
- 6) Evaluation of mosquito repellent activity
- 7) Repellence test
- 8) Irritation test

1) PHYSICAL EVALUATION

- **Colour:** Greenish Grey
- **Odor:** Aromatic



2) FLAMMABILITY TEST

- The flammability and the burning time of the dhoop was checked by burning the dhoop.
- It was observed that the dhoop was burnt completely creating low smoke & burning time was noted.



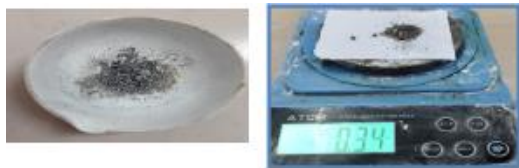
3) MOISTURE CONTENT TEST

- The initial weight of the prepared dhoop is ignited and also the final weight of the dried dhoop was noted.
- Wet weight of one dhoop = 5gm.
- Dry weight of dried dhoop = 3.48gm.
- **Moisture content** = $\frac{\text{Wet weight of dhoop} - \text{Dry weight of dhoop}}{\text{Wet weight of dhoop}} \times 100$

$$\begin{aligned} \text{Dry weight of dhoop} &= 5\text{gm} - 3.48\text{gm} \times 100 \\ &= 3.48\text{gm} \\ &= 43.67\% \end{aligned}$$

4) ASH VALUE TEST

- The dhoop was burnt completely and the ash was collected & weighed.



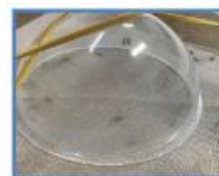
such as irritation, coughing and tears was observed and recorded.

**5) SMOKE TOXICITY TEST**

- Smoke toxicity experiment was conducted in a chamber.
- The mosquitoes were attracted by using a pair of socks and the mosquitoes were exposed to the smoke of burning incense for 45 minutes.
- The mortality data was recorded after every 15 minutes.

**7) REPELLENCE TEST**

- Repellence test performed in a net of cuboidal shape with an opening so that the mosquitoes can escape through.
- The dhoop was burn inside the net.
- The times taken by the mosquitoes try to escape or to get number or to be killed was noted.

**6) EVALUATION OF MOSQUITO REPELLENT ACTIVITY**

- The dhoop was burnt in the mosquito prone areas in the evening and night period.
- For investigating mosquito repellent activity, the prepared incense sticks are checked for causal effect

8) IRRITATION TEST

- To Evaluate the Irritation potential of dhoop sticks.
- Burn the dhoop sticks and observe signs of Irritation like coughing, sneezing or eye Irritation and record any Observed Effect.

RESULTS

S.no	Evaluation	Observation	Test Result
1	Physical Evaluation Colour: Odour:	Greenish Grey Aromatic	Positive
2	Flammability test:	Dhoops are flamed for 18 mins	Positive
3	Moisture Content Test Wet Weight: Dry Weight:	5gms 2.48gms	Positive
4	Ash Value test:	0.36gms	Positive
5	Smoke toxicity test: <ul style="list-style-type: none"> No. of mosquitoes No. of mosquitoes died. Time (in mins) Temperature Burning time 	Marketed dhoop 10 8 20mins 21°C 20mins	Formulated dhoop 10 7 24mins 21°C 18mins
6	Evaluation of Mosquito repellent activity test:	Mosquitoes escaped, Less irritation, No coughing, No tears, No headache.	Mosquito repelled
7	Repellence test	Marketed dhoop	Formulated dhoop

8	<ul style="list-style-type: none"> No. of mosquitoes No. of mosquitoes escaped. 	10 9	10 7
	<ul style="list-style-type: none"> Time (in mins) Temperature Burning time 	20mins 21°C 20mins	24mins 21°C 18mins.
	Irritation Test We are conducted Three trails by using different Oils was used.		
	<ul style="list-style-type: none"> Trail 1: By using Eucalyptus oil. 	Headache, Tears were observed	Headache, tears were observed.
	<ul style="list-style-type: none"> Trail 2: By using peppermint Oil. Trail 3: By using Lavender oil, peppermint oil & Eucalyptus oil. 	Cough, tears were observed. No side Effects.	Cough, tears were observed. No side effects.

+

CONCLUSION

Mosquitoes spread severe diseases, underscoring the need for safe affordable, and user-friendly repellents. Plant based essential oils have demonstrated high repellent activity. Our study concludes the formulated Zingiber Mosquito repellent dhoop sticks offers an effective, low cost, Non-toxic, alternative to chemical-based mosquito repellents. This dhoop sticks promotes a healthy, mosquito-free environment and are eco-friendly also prevent insect resistance.

REFERENCES

- <https://www.healthline.com>
- Patel Ek, Gupta A, Oswal RJ (2012) A Review on: Mosquito Repellent Methods, International Journal of pharmaceutical, Chemical and Biological sciences 237:30-317.
- Sneha A, Nidhi H, Aniket J (2018) formulation of Natural Mosquito Repellent International Journal of advance research, ideas and innovations in technology 4(1) 11-17.
- Priyanka 5. sandhya 4, Nandu k (2023) Development and Evaluation of Herbal Mosquito Incense Repellent. International Journal of Research publication and Reviews 4(8):4714-4718./ Sanjay , Santosh
- <https://www.mass.gov>.
- <https://www.science direct.com>
- <https://www.hopkinomedicine.org>
- <https://www.medicalnewstoday.com>
- <http://what-pharna journal.com>
- <https://blue craft gro.com>
- <https://www.chemienterppisebllip. com>
- <https://go.drongbank.com>
- <http://www. shi Nohakti India. In Mallenden off.>
- <https://dogon languages.org>
- <https://www.hopkins medicine.org>.
- <https://www.medical news today com.>
- <https://www.sciencedirect.com>
- <https:// www.Nishta.com>.
- <https://www.organicallyt pic. Uk>.
- <https://www.sysreu pharm.org>.
- <https:// www.Healthline.com>.
- <https://www.Health Hazard. Edu>