INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES
[ISSN: 0975-4725; CODEN(USA): IJPS00]
Journal Homepage: https://www.ijpsjournal.com

OPEN ACCESS

Review Article

Herbal Mosquito Repellent Cream

Vedanti Ashok Salunkhe*, Dhananjay Vishnu Shelar, Shirke S. S.

Meruling Shikshan Sanstha's College of Pharmacy, Medha.

ARTICLE INFO

Published: 22 Aug. 2025
Keywords:
Mosquito repellent cream, Neem, Aloe Vera, lavender oil, liquid paraffin, bees wax, borax, methyl parable, rose oil
DOI:
10.5281/zenodo.16926864

ABSTRACT

Natural herbs, remedies, and procedures are generally safer than chemical products due to their fewer side effects. The ingredients, often sourced from nature and our surroundings, are readily available and also offer nutritional benefits. From a topical perspective, they are not only accessible but also promote overall body health. Mosquito repellent is a substance applied to the skin or other surfaces to prevent insects (and arthropods in general) from landing or crawling on them. Interest in plant-based repellents has resurfaced due to concerns over resistance development, cross-resistance, potential toxicity risks linked to synthetic insecticides, and their increasing cost. Mosquito repellent cream is a natural and safe herbal preparation which gives calming, soothing and astringent effect on the skin. In this Mosquito repellent cream natural ingredients like Neem leaves, Aloe Vera and lavender oil are used for the formulation. Instead of this liquid paraffin, bees wax, borax, rose oil and methyl parable like partially chemical substances used to give consistency and preserve product and protect skin from mosquitos for long time. It having ability to reduce the irritation as well as to enhance protection of skin and gives naturally safety to the skin without harmful chemicals. We can use it in our day-to-day life. Most important advantages of herbal mosquito repellent cream are, they are nontoxic and multifunctional in nature and they having ability to reduce side effects and allergic reactions which can occur due to chemically formulated products. For knowing and presenting the information and usefulness of the herbal mosquito repellent cream we have decided to do this project.

INTRODUCTION

The world is increasingly embracing herbal formulations, which are recognized for their effectiveness against a wide range of diseases and ailments. It is important, however, to include proper acknowledgment that plant-based remedies can be both effective and free from adverse effects. Numerous herbs and shrubs possess not only medicinal and healing properties but also mosquito parricidal and repellent capabilities. Since synthetic liniments can have harmful impacts on

***Corresponding Author:** Vedanti Ashok Salunkhe
Address: *Meruling Shikshan Sanstha's College of Pharmacy, Medha.*
Email ✉: vedantisalunkhe@gmail.com

Relevant conflicts of interest/financial disclosures: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

the environment and non-target organisms, plant-derived products with insecticidal properties have recently been explored as traditional alternatives for managing various insect pests and vectors.(1). Mosquitoes are among the most troublesome blood-sucking insects affecting humans. Species from the Anopheles, Culet, and Aides genera act as vectors for pathogens responsible for diseases such as Dengue fever, Malaria, and Yellow fever. When a mosquito bites, it injects saliva into the host's bloodstream, triggering an immune response as antibodies like Iggy and I.e. bind to the antigens. This reaction often leads to irritation, itching, redness, and sometimes the formation of bumps. The mosquito's saliva is primarily responsible for the rash, which can be quite bothersome. Additionally, mosquito bites may cause significant skin irritation due to allergic reactions resulting from human contact with mosquito saliva. (2). A mosquito repellent is a substance applied to the skin, clothing, or other surfaces to discourage mosquitoes from landing on them. It is formulated in a way that makes the surface unpleasant and unattractive to mosquitoes, thereby reducing contact between humans and mosquitoes. Mosquito repellents work by repelling insects rather than killing them, and thus, they are not classified as insecticides or pesticides. These products play a vital role in preventing and controlling the spread of mosquito-borne diseases such as Dengue fever, Malaria, Yellow fever, and Japanese Encephalitis. They contain active ingredients that repel mosquitoes by blocking their olfactory receptors, which detect carbon dioxide and lactic acid released through human perspiration. Additionally, these repellents include other ingredients that enhance the product's cosmetic appeal and application. (3). Herbal formulations are dosage forms composed of one or more raw or processed herbs in specific proportions, designed to provide targeted nutritional or cosmetic benefits for the diagnosis, treatment or prevention of diseases in humans or animals. These preparations are considered more effective and are believed to cause fewer side effects compared to synthetic chemical alternatives, as they are derived by extracting active compounds from herbal plant sources. A mosquito repellent is a substance that deters mosquitoes from approaching or settling. Repellents are formulated for use on bare skin. They are sold as aerosols, creams, solids (sticks), pump Sprays and liquids. ▪ Nowadays majority of serious diseases or infections are caused by mosquitoes mainly female anopheles mosquito like Malaria, Dengue, Chikungunya, Lymphatic Filariasis , Zika , etc.

Malaria: Malaria is an arthropod borne disease caused by plasmodium parasite (P.vivax , P.falciparum , P.malariae , P.ovale) transmitted by the infected mosquito. Major Vector : Anopheles stephensi , A. culcifacies.

Dengue: Dengue (break-bone-fever) is a viral infection caused by flavi virus(DEN- 1,DEN-2,DEN-3,DEN-4)serotypes. Major Vector: Aedes egypti , Aedes albopictus.

Chikungunya: Chikungunya ia an illness caused by a virus called chikungunya.Transmitted to people through the bite of infected mosquito Major Vector:Aedes albopictus,A.aegypti.

Lymphatic Filariasis: This disease is caused by filoriadea type round worm parasite (Wucheresia bancrofti). Major Vector: Anopheles culex , Aedes and Monsonia.

Zika Virus: Zika virus is a mosquito-brone virus associated with a birth defect called microcephaly.Major Vector: Aedes aegypti , Aedes albopictus. Dizziness Nausea and Vomiting Breathless Itching and Rash To prevent this disease there are multiple conventional Synthetic

Mosquito Repellent in Market. This synthetic formulations consist of various hazardous chemicals that causes various acute and chronic health problem in humans and may lead to environmental pollution.

Mechanism Of Action by Insect Repellents

According to Acree et al.(1968), Aedes aegypti is Attracted to lactic acid which is a component of human Sweat. Studies done by others on the behaviour of Mosquitoes indicated that lactic acid was only slightly Attractive alone. This therefore proves its synergistic Effect with carbon dioxide and other unidentified Components of human odour that may be essential. Compounds such as steroids, phenols, carboxylic acids, Indoles that exude fromanimals attracts mosquitoes Physiological sensory studies on insect gives the Impression that mosquito repellent reduce biting rate by Interfering with host-enticing signals and change aSensual information to a repulsive one due to activation of Many sensory receptors leading to confusion of the Mosquito.

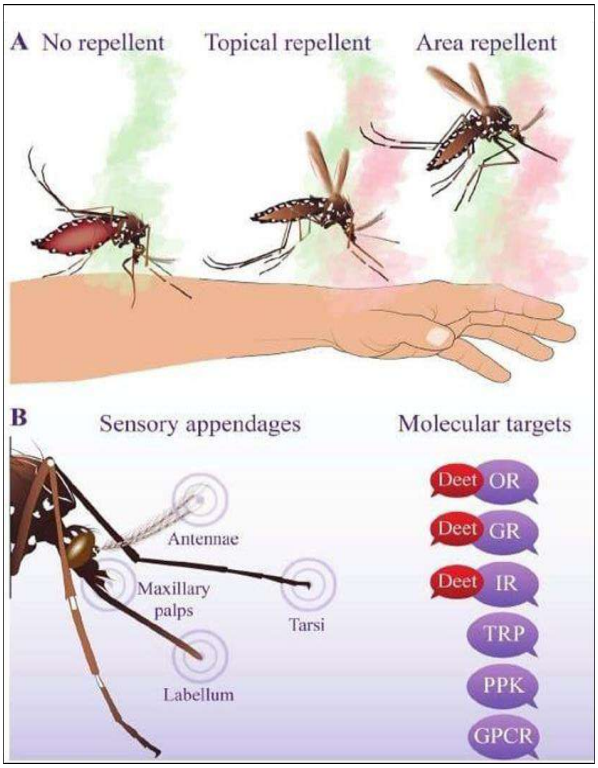

Fig no.1 mechanism of action by mosquito repellent

Advantages of herbal mosquito repellent cream

- It is Convenient and easy to apply.
- It is safe and Natural.
- Mosquito repellent cream is easy to use.
- It is Aromatic
- Relieves itch and irritation. It is natural and free from all the harmful synthetic chemicals.
- Preventing mosquito bites.
- Reducing the risk of diseases.
- Protection from bites. (4)

Marketed product of mosquito repellent cream

a. Odooms
b. Mama earth
c. Good night
d. Body hug

Fig no 2. Marketed product

3. Drug Profile

A] Herbal Ingredients (API): -

1) Neem Leaves –

Fig no.3 neem leaves

- **Synonym:** margosa, Indian Lilac and Azadirachta indica.
- **Scientific name***: Azadirachta indica*
- **Biological source :** Neem consists of the fresh or dried leaves and other aerial parts of *Azadirachta indica.*
- **Family :** Meliaceae
- **Chemical constituents:** quercetin, nimbosterol, nimbin (5)
- **Uses :**

i. Neem has properties is an effective herb to treat hair loss.

ii. It has antifungal properties that may help within the treatment of dandruff.

iii. The regenerative properties of neem help in reducing hair fall.

iv. It helps the hair follicles to become stronger and also encourages hair growth.

v. Its medicinal properties are an effective herb to treat hair loss.

vi. The extracts of the leaves are widely used in skincare and hair care products (6)

Aloe Vera –

Fig no.4 Aloe vera

- **Botanical Name:** *Aloe barbadensis miller*
- **Synonym:** Aloe Vera, Korfad, Musabbar.
- **Order:** Asparagales
- **Biological source :**it is Dried latex of leaves
- **Family:** Aloaceae, Asphodelaceae
- **Chemical constituent:** Cinnamic acid, Chromones, Anthracene compounds, Orientin, Isovitexin
- **Uses:**

i. The herb is packed with vitamin A and C, so works hard to keep your skin and hair glossy.

ii. It also has astringent properties, which help to minimise your pores, as well as keep your oil levels balanced.(7)

Lavender Oil –

Fig No 5. Lavender Oil

- **Biological name:** Lavendula latifolia
- **Biological source:** Lavender oil is derived from the flowering tops and leaves of the plant, particularly the species Lavendula latifolia .
- **Family:** Lamiaceae
- **Chemical constituents:** linalool, linalyl acetate, camphor, lavandulol
- **Use:**

i. Lavender oil does double duty for insect bites.

ii. It acts as an insect repellent, and it can relieve itching after a bite occurs.

iii. Many commercial mosquito repellents contain lavender oil.

iv. Both candles and sprays can be used to repel mosquitos and other bugs. (8)

B] Excipient Profile: -

1) Bees Wax –

Fig No 6. Bees Wax

- **Synonym:** Paraffin wax ,yellow wax ,yellow bees wax .
- **Biological source:** Obtained from the honeybees.
- **Family:** Apidae.
- **Uses:**

i. It is used in ingredients of surgical bone wax which is used during surgery to control bleeding from bone surface.

ii. It is used in lip balm, lip gloss, hand creams, salves and moisturizers.

iii. It is also used in eye liners, eye shadows, and blush

iv. It is also the main ingredient in moustache wax and hair pomades which make hair look silky and shiny. (9)

Rose Oil

Fig No .7 Rose Oil

- **Synonyms**: Gulab

- **Biological source**: Rosa
- **Family:** Rosaceae
- **Use**:

it is used as a Flavoring Agent It is used as perfume. (10)

2) Methyl paraben

Methylparabens occur naturally in several fruits, including blueberries. However, manufactures often produce the compound artificially by combining a type of 4-hydroxybenzoic acid and methanol.

Structure:

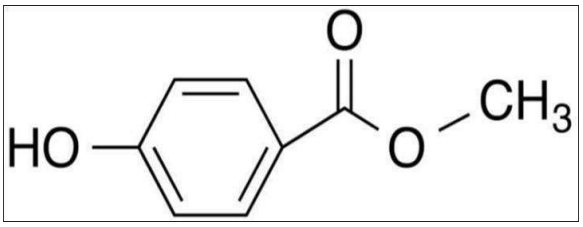

Fig no.8 structure of methyl paraben

- **IUPAC Name :** methyl 4-hydroxybenzoate
- **Chemical formula:** C8H8O3
- **Molar mass :** 152.15 g·mol−1
- **Uses :**

i. It is mainly used as preservative.

ii. Methyl paraben is commonly used to prevent the growth of mold and other harmful bacteria.

iii. It used to prevents germ growth.

iv. It used as a food preservative or an antifungal preservative.(11)

3) Borax

It is a colorless crystalline solid that dissolves in water to make a basic solution. It is commonly available in powder or granular form and has many industrial and household uses

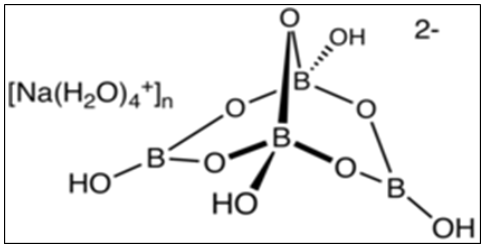

Fig No.9 Structure Of Borax

- **IUPACName:**disodium;3,7-dioxido-2,4,6,8,9-pentaoxa-1,3,5,7-tetraborabicyclo[3.3.1]nonane;decahydrate
- **Chemical formula:** Na2B4O5(OH)4·8H2O
- **Molar mass:** Na2B4O5(OH)4·8H2O(12)
- **Uses :**

i. It is used as Buffer and pH Control.

ii. It has Mild Antiseptic and Antifungal Properties

iii. It can be used in topical astringents and eyewash solutions.

iv. Borax may be considered for use in wound care products, though more research is needed to determine its effectiveness and safety.(13)

5) Liquid Paraffin

Liquid paraffin, also known as paraffinum liquidum, paraffin oil, liquid paraffin oil or Russian mineral oil, is a very highly refined mineral oil used in cosmetics and medicine. Cosmetic or medicinal liquid paraffin should not be confused with the paraffin used as a fuel. (14)

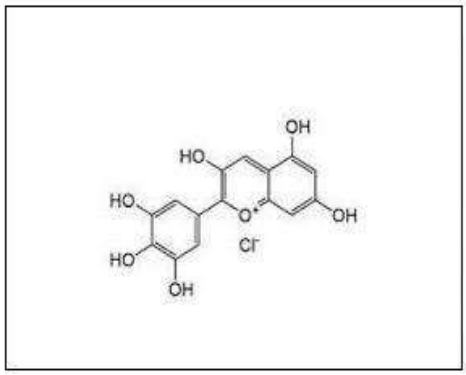

Fig no.10 structure of Liquid paraffin fig no.11 bottle of liquid paraffin

- **Chemical formula:** CnH2n+2
- **Molar mass :** 210 g/mol to 1120 g/mol.
- **Uses :**

i. Liquid Paraffin is used in the treatment of dry Skin.

ii. Liquid paraffin is used in creams primarily as an emollient and occlusive agent

iii. It forms a protective layer on the skin, reducing water loss and keeping the skin moisturized, making it soft and supple

iv. This relieves dryness and leaves the skin soft and hydrated.(15)

Ethyl Alcohol –

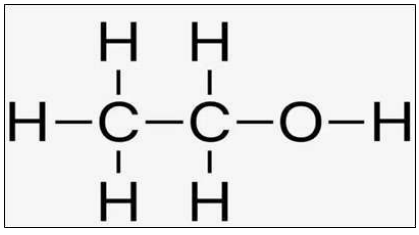

Fig no.12. structure of ethyl alcohol

- **IUPAC Name:** ethanol
- **Chemical Formula:** C_2H_6O
- **Molar mass:** 46.068 g/mol**Uses :**

i. Ethanol is used in the pharmaceutical industry as a solvent.

ii. Ethanol is used in the pharmaceutical industry as a disinfectant.

iii. Ethanol is used as preservatives.

iv. It dissolves medications, making them easier to administer, and helps prevent contamination in injectable drugs.

v. Ethanol is also used as a topical antiseptic and in some cases as an antidote for certain poisonings. (16)

2. Aim And Objectives

Aim: -

To formulate and evauate the herbal mosquito repellent cream from neenm leaves ,aloe vera and lavender oil .

Objectives :-

1) To Formulate and evaluate herbal mosquito repellent cream with Nem leaves ,aloe vera and lavender oil

2) Mosquito repellent cream is used to protect the skin from insects .

3) To reduce skin irritation, allergy, insecticidal properties.

4) To prevent mosquito bites and spread of mosquito –borne dieases like malaria ,dengue fever and zika virus .

3. Need Of Work

1. Public Health Protection

Disease prevention: Mosquitoes transmit diseases like malaria, dengue, chikungunya, Zika virus, and West Nile virus.Vulnerable populations: Children, pregnant women, and people in tropical or rural areas are at higher risk.

2. Effectiveness and Long-lasting Protection

Current repellents may offer only a few hours of protection. Improving formulations for extended efficacy is crucial.

3. Safety and Skin Compatibility

Some repellents, especially those with DEET or similar chemicals, can cause skin irritation or allergic reactions.Natural or non-toxic alternatives need research to ensure they are both safe and effective.

4. Environmental Impact

Chemical repellents can be harmful to the environment and aquatic life if not disposed of properly. Developing eco-friendly formulations is necessary.

5. Resistance Management

Continuous use of certain chemicals can lead to mosquito resistance. Novel active ingredients or combination formulas are needed to reduce this risk.

6. Cost and Accessibility

Affordable options for low-income communities are essential, especially in regions where mosquito-borne diseases are endemic. There is need of this work because there are number of diseases spread Across the world due to Mosquitoes bite like malaria, Dengue etc. hence we need to prevent this Diseases by applying mosquitoes repellent cream .Thus the synthetic cream has so many adverse drug reaction which posess life thretning condition.hence we have prepared the herbal mosquito repellent cream from protection of mosquito.

4. Plan Of Work

This will be structured as per the plan of the work given below:

1. Review literature.
2. Selection of plant material
3. Identification and collection of plant material.
4. Extraction of plant material.
5. Formulation of herbal mosquito repellent cream.
6. Evaluation of herbal mosquito repellent cream.

7. MATERIAL AND METHOD

Material For Mosquito Repellent Cream: -

List of Material The herbs and powders used in the present formulation work have been procured from authenticated supplier and are research-grade. Some material obtained from pharmacognosy lab and some are obtained from marketed as mentioned below in table. (18)

Table no .1 Materials for mosquito repellent cream

Sr. No	Name Of Ingredient	Active Constituent	Use

1.	Neem leaves	Alkaloids, flavonoids ,limonoids ,saponins	Anti bacterial
2.	Aloe vera	Aloin, amino acid, salicylic acid	Base ,antimicrobial
3.	Lavender oil	Linalool,linalyl acetate	Insect repellent
4.	Beeswax	Ester,fatty acids ,hydrocarbons	Stabilizing agent, Emollient
5.	Liquid paraffin	Hydrocarbons	Helping to moisturize and protect skin
6.	Borax	Sodium tetraborate decahydrate	Preservative
7.	Water	-	Solvent
8.	Methyl paraben	Inactive ingredient	Used as preservative
9.	Ethyl alcohol	Sugar,starch ,carbohydrates	Solvent
10.	Rose water	Phenethyl alcohol	Provide moisture to the skin ,fragrance

❖ **Instruments**

1. Digital Weighing balance
2. pH meter
3. Heating mantle
4. Ostwalds viscometer

❖ **METODOOGY**

Table no.2 formula for mosquito repellent cream

1.	Neem leaves	2 ml	3 ml	4ml
2.	Aloe Vera	2 ml	3ml	4ml
3.	Lavender oil	2 ml	3ml	4ml
4.	Beeswax	5 gm	5 gm	5 gm
5.	Liquid paraffin	7ml	7 ml	7ml
6.	Borax	2 gm	2 gm	2gm
7.	Water	Q.S.	Q.S.	Q.S.
8.	Methyl paraben	0.02 gm	0.02 gm	0.02 gm
9.	Ethyl alcohol	0.5 to 2 ml	0.5 t 2 ml	0.5 to 2 ml
10.	Rose water	5 ml	5 ml	5 ml
11.	Rose oil	Q.S.	Q.S.	Q.S.

Experimental Work

A) Pre – Formulation Studies

Collection Of Plant Material:

1. Neem Leaves: -

Fresh neem leaves were gathered, cleaned, and left to dry at room temperature (25-27°C) for two weeks. Once fully dried, the leaves were ground using a mixer grinder, and the resulting powder was sieved through a No. 60 mesh to obtain a fine consistency. The finely powdered material was

then stored in an airtight container for preservation. (20,21)

Fig No13. Neem Powder

1. Aloe Vera :-

Mature and Fresh aloe vera leaves are cut at the base . (22)

3. **Lavender :-**

Fresh and mature lavender flowers were gathered and cleaned .then the flowers are ready for the extraction .(23)

Fig No 14. Lavender Powder

Extraction Of Plant Material

1.Extraction Of Neem (Decoction Method):-

Take 10 gm of neem powder in 250 ml cleaned and dreied beaker. Then add 100 ml of water in it. Heat the mixture for 1 hour in water bath . Then filter the extract by using vaccume filter and whatmann filter paper.Concentrate the extract upto required quantity by evaporation on heating mentle.This extract further uses for the preparation of herbal mosquito repellent cream .(22)

Fig no15. decoction process of neem

Extraction of Aloe Vera:-

After the cutting aloe vera leaves from the base ,Aloe vera leaves contain a yellowish latex between the skin and gel that can be irritating if consumed or applied .to remove it ,the leaves are kept upright for 15-30 minutes to drain the latex .then the thick green outer skin is carefully removed with a knife or peeler .only the inner clear ,mucilaginous gel is collected.

Fig No 16. Extraction of Aloe Vera

Extraction Of Lavender Oil :-

Lavender flowers are harvested when oil content is high. The flowers are dried slightly to reduce water content without losing aroma .flowers are placed in a distillation still (container). Steam is passed through the flowers .Heat causes the plants oil glands to rapture ,releasing essential oil into the steam .the steam carrying the oil passes into a cooling system (condenser),where it turns back into liquid .oil floats on top of the condensed water and is separated.(20)

A) Formulation Studies Procedure After Extraction: -

1. The prepared extract from the crude drugs like neem leaves extract ,aloe vera extract and lavender oil extract by weighing them in a beaker and mixed together .
2. Then dissolve borax in hot rose water .
3. add ethyl alcohol and extract of herbal crude drug .
4. Melt the bees wax keeping the temperature about 70 ^{0} c.
5. Take separately the ingredient of aqueous phase and perfume for mix them and heat to same temperature as oil phase with continuous stirring .
6. Add oil phase and water phase in a beaker and stir well .
7. Transfer the mixture of oil phase and aqueous phase in morter pestle and add bees wax slowly in it .
8. Stir the mixture for 1 hour .
9. Add perfume and preservative in it

   Then, now the formulation was filled in the container .(20)

Fig no.17 formulation of mosquito repellent cream

9. Evaluation Test for Mosquito Repellent Cream

1. Physical Properties:

the physical properties of cream was judge by its colour, odour , appearance and consistency (23)

2. Spreadability Test:

A small sample of cream was taken in a glass slide and it was compressed between two glass slides to uniform thickness. The time in which the upper glass slide moved over the lower slide is calculated as measure of spreadability.

$$S = m \times L \square T$$

Where,

S=Spreadability

m= weight tried to upper glass slide L=length move on glass slide

T= time taken .(24)

1. Homogeneity:

Homogeneity of the formulated cream was evaluated by visual appearance and touch. The consistency is determined by examining its softness, greasiness, and stickiness (24)

2. PH Determination

The pH meter was calibrated. The pH measurement of the cream was carried out by dissolving 0.5g of cream in 50ml of distilled water and the measurement was done using a digital pH meter (24)

5. Phase Separation:

The cream to be tested was placed in a closed container away from sunlight and the phase separation was observed every 24 hours for 30 days.(25)

6. Irritancy Test:

The cream was applied to the specific area on the dorsal surface of the left hand and the time was noted.(25)

7. Washability Test:

A small amount of cream was applied on the hand and then washed with the tap water .(25)

10. RESULT AND DISCUSSION

All the ingredients are combined together in adequate amount to make a homogeneous combination of all these ingredients mentioned in above formulation table No.1. This contains of variation of concentrations and weight in ingredients. Optimization of F2 best batch from three distinct batches F1, F2 and F3 for 15gm of herbal mosquito repellent cream was carried out. From these formulation batch F2 having good quality of product is considered as final preparation. The result showed that all ingredients used to formulation of mosquito repellent cream were found to be safe. The formulated shampoo was clear and appearance was good. On the final formulation there were performed various tests and all the result were recorded. No any discolouration was found after light exposure to the formulation. The formulation was also effective to conditioning on the skin and non irritant on skin. At last removabilty of mist was found to be easily removable.

1. Physical properties:

Table no. 3 physical properties

Sr. No	Physical Properties	F1	F2	F3
1.	Colour	Cream colour	Cream colour	Cream colour
2.	Odour	Pleasant	Pleasant	Pleasant
3.	Appearance	Smooth	Smooth	Smooth
4.	Consistency	good	good	good
5.	Description	Semi solid	Semi solid	Semi solid

2. Spreadability test:

Table No.4 Spreadability Test

Sr.no	Batch	Spreadability
1.	F1	22.8
2.	F2	32.4
3.	F3	15.18

3. Homogenecity:

Table no.5 homogenecity

Sr.no	Homogenecity	F1	F2	F3
1.	Softness	soft	soft	Soft
2.	Greasiness	Non-greasy	Non-greasy	Non-greasy
3.	Stickiness	Non-sticky	Non-sticky	Non-sticky

4. PH determination:

Table no. 6 PH determination

Sr.no	Batch	PH
1.	F1	8.9
2.	F2	9.1
3.	F3	9.4

5. Phase separation:

Table no. 7 phase separation

Sr.no	Batch	Phase separation
1.	F1	No phase separation
2.	F2	No phase separation
3.	F3	No phase separation

6. Irritancy test:

Table no.8 irritancy test

Sr.no	Batch	Irritancy
1.	F1	Non-irritable
2.	F2	Non-irritable
3.	F3	Non-irritable

7. Washability Test:

Table No.9 Washability Test

Sr.no	Batch	Washability
1.	F1	Easily –washable
2.	F2	Easily –washable
3.	F3	Easily –washable

11. CONCLUSION

The main purpose behind this investigation was to develop a stable functionally effective mosquito repellent cream . It was found to be harmless and effective. The herbal mosquito repellent cream was prepared & protect the skin from the mosquito .The prepared herbal formulation have certain advantages like easy application and no any side effect . The result from herbal cream is very statisfactory The semi soild form of herbal cream protect the skin from mosquito cream and give immedietly action .It was also found that lavender oil , neem leaves and aloe vera gave the best result. The methyl paraben preserving the formulation for more time and glycerin also draws moisture and increases hydration and stops dryness. Prepared formulation was physiologically stable from this it was found that prepared herbal mosquito repellent cream can be successively used for balancing pH of the skin. From these formulation batch F2 having good quality of product is considered as final preparation.

REFERENCES

1. SeyoumA, Kabru EW, Lwande W, Hassanali A, Knols BGJ. Repellency of live potted plants against Anopheles gambie from human baits in semi field experimental huts. American journal of tropical medicine and hygiene. 2002;67:191-195.
2. S. D. Chavare*, K. M. Karande, N. H. Aloorkar, A. S. Kulkarni, S. H. Majumdar, “Formulation of Novel Herbal Mosquito Repellent: A New Approach in Antimalarial Management” Int.J. MediPharm Res. 2015,1 (2), pp 78-85.
3. S. Mandal, “Repellent activity of eucalyptus and azadirachta indica seed oil against the filarial mosquito culex quinquefasciatus say (Diptera: Culicidae) in India,” Asian Pacific Journal of Tropical Biomedicine, vol. 1, no. 1, pp. S109–S112, 2011.

4. Sanjit Singh, Md. Zulqarnain, Dr. Abhishek Prasad. Development and Evaluation of Poly Herbal Mosquito Repellent Cream from Marigold Flower; World Journal of Pharmaceutical Research, 2021; 10(4): 1108-1128.
5. Khare CP. Tridax procumbens Linn. Indian Med Plants. 2007;11(10):1–1
6. Pandey J, Vimal KS, Shashi T, Raja W. Asian Journal of Research in Biological and. Asian j pharm biol res. 2019;7(3):65–70.
7. The Ayurvedic Pharmacopoeia Of India
8. Afaf Farag, Shahba; Osama Halawa; Mohamed Ragei; Mohamed Hashen; Development of Longer lasting insect repellenc cellulosic based curtain fabrics, Material science and application, National research center Cairo Egypt, 2011; accessed 15/12/2011
9. A Review On: Mosquito Repellent Methods, EK. Patel*, A. Gupta and RJ. Oswal1, Department of Pharmaceutics, JSPM`s Charak College of Pharmacy & Research, Wagholi, Pune, Maharashtra, India.1 Department of Pharmaceutical Chemistry, JSPM`s Charak College of Pharmacy & Research, Wagholi, Pune, Maharashtra, India.
10. Of Local Plants for Their Repellent Activity against Mosquitoes (Diptera: Culicidae), B. Sai Shankar, T. Saravanan, M. Ragavi, G. Kaviya, Ankita Anushree, Arul Samraj Samue Tennyson, Department of Zoology, Madras Christian College, Chennai 600 059, Tamil Nadu, India
11. Puri A V. Duranta Repens Linn. (Verbenaceae): A Comprehensive Review Of Pharmacognostic, Ethnomedicinal, Pharmacological, And Phytochemical Aspects. 2018;11.
12. Vibhavari M Chatur, Sanjay G Walode, Siddhi A Awate, Minal U Gandhi, Vaishnavi S Thorat. Formulation and physical characterization of herbal face gel toner. World Journal of Advanced Research and Reviews. 2021 Jul 30;11(1):138–45.
13. Kant Parashar K, Somas NA. Issue 10 www.jetir.org (ISSN-2349-5162) [Internet]. Vol. 5, JETIRFH06101 Journal of Emerging Technologies and Innovative Research. 2018. Available from: www.jetir.org
14. Farman Hussain, Saman Pathan, Kailash Sahu, Bhaskar Kumar Gupta. Herbs as cosmetics for natural care: A review. GSC Biological and Pharmaceutical Sciences. 2022 May 30;19(2):316–22.
15. Cosmetic Dermatology PRINCIPLES AND PRACTICE SECOND EDITION.
16. Baumann L. Understanding and Treating Various Skin Types: The Baumann Skin Type Indicator. Vol. 26, Dermatologic Clinics. 2008. p. 359–73.
17. Chavan P, Bajaj A, Parab A. Topical Sprays: Novel Drug Delivery System. International Journal of Pharma And Chemical Research [Internet]. 2(2). Available from: www.ijpacr.com
18. Tyagi A, Antil S. To Prepare Herbal Face Toner and Comparative Evaluation with Marketed Herbal Toner. International Journal of Pharmaceutical Research and Applications [Internet]. 8:2249–7781. Available from: www.ijprajournal.com
19. Miss. Sapana Mhaske, Miss. Vaishnavi Wayal, Miss. Harshada Tribhuvan, Miss. Poonam Kute, Prof. Shital Gaikwad. Formulation and Evaluation of Herbal Face Toner. International Journal of Advanced Research in Science, Communication and Technology. 2022 Jun 19;619–23.
20. Umar AK, Butarbutar M, Sriwidodo S, Wathoni N. Film-forming sprays for topical drug delivery. Drug Des Devel Ther. 2020;14:2909–25

21. Ibrahim SI, Fakhraddeen YM, Hauwa UA, mosquito repellent activity of leaf and seed extract of Azadirachta indica (Neem); Journal of Malaria Research and Phytomedicine, 2019: 19-20
22. Formulation And Development Of Herbal Products Containing Hibiscus Rosa-Sinensis. 2022;10(7):86–113.
23. Anuradha Keshwar*, Unmesh Keshwar, Ashwini Deogirkar, S. S. Dhurde, Veena Deo and
24. B. K. Shrikhande Keshwar et al., "Formulation development and evaluation of cream containing natural essential oils having mosquito repellent property" World Journal of Pharmacy and Pharmaceutical Sciences 2016 Vol 5, Issue 8
25. Ms. Shubhangi Sharad Bhide1, Ms. Babita Himmatrao More2, Ms. Suvarna Prabhakar Gajare3, Mr. Sachin Vinayak Tembhurne4 Bhide et al, "Development of mosquito repellent formulations and evaluation for its activity" World Journal of Pharmaceutical Research Vol 3, Issue 2, 2014.
26. Sanjit Singh, Md. Zulqarnain, Dr. Abhishek Prasad. Development and Evaluation of Poly Herbal Mosquito Repellent Cream from Marigold Flower; World Journal of Pharmaceutical Research, 2021; 10(4): 1108-1128.

HOW TO CITE: Vedanti Ashok Salunkhe*, Dhananjay Vishnu Shelar, Shirke S. S., Herbal Mosquito Repellent Cream, Int. J. of Pharm. Sci., 2025, Vol 3, Issue 8, 2364-2378 https://doi.org/10.5281/zenodo.16926864