

RESEARCH REPORT

Testing efficacy of N, N-Diechylbenzamide with Vitamin E and Almond against different species of adult mosquito density in Greater Noida

Overview

- **Title of the Report:**
Testing Efficacy of N, N-Diechylbenzamide with Vitamin E and Almond, on *An. stephensi* adult density in Greater Noida.
- **Principal Investigator(s):**
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- **Affiliation:**
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- **Date of Submission:**
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Introduction

This report evaluated the efficacy of a formulation containing N, N-Diechylbenzamide with Vitamin E and Almond as a mosquito repellent against different species of adult mosquitoes under controlled laboratory conditions in Greater Noida. The study consisted of three treatment replicates and one control trial. It also examined the influence of environmental factors, including temperature and humidity, on mosquito activity and repellent performance. Data were collected on 09-07-2025 and 14-07-2025.

Summary

The experiment was conducted in lab – testing room (12*12 m), where 60 adult mosquitoes 20 of each of three viz. *Aedes*, *Anopheles* and *Culex* were released. N, N-Diechylbenzamide with Vitamin E and Almond demonstrated an average protection rate of 92.22% across the three replicates, indicating strong initial repellency. Observations showed that humidity (ranging from 40% to 75%) and temperature (~28°C) moderately influenced the effectiveness of N, N-Diechylbenzamide with Vitamin E and Almond.

Materials Used:

- Mosquito Repellent - containing N, N-diethyl-benzamide
- Negative Control: No repellent
- Female mosquitoes (mixed species) - (3–5 days old, non-blood-fed)
- Human volunteers (screened, medically fit, non-allergic)
- Unscented soap and paper towels
- Aspirators
- Timer/stopwatch
- Thermo-hygrometer
- PPE (gloves, mask, lab coat)

Procedure:

Mosquito Preparation:

- 60 healthy female mosquitoes were used in each replicate.
- Mosquitoes were starved for 12 hours prior to testing.

Volunteer Preparation:

- Volunteers washed their forearms/feet with unscented soap and dried them completely.
- A marked area on the forearm or foot was designated for repellent application.
- N, N-Diechylbenzamide with Vitamin E and Almond was applied evenly over the marked area at a standardized dose (1–2 mg/cm²) and was allowed to dry for 5 minutes before exposure.

Observations:

- Mosquitoes were released into the test chamber.
- Observers recorded:
Number of probing attempts
Number of landing catch

Results:

Experiment No	Total Mosquitoes	Exposure Time (min)	Landing Catch	Temperature (°C)	Humidity (%)
1	<i>Anopheles</i> + <i>Aedes</i> + <i>Culex</i> = 60	60	3	28	40
2	<i>Anopheles</i> + <i>Aedes</i> + <i>Culex</i> = 60	60	2	28	40
3	<i>Anopheles</i> + <i>Aedes</i> + <i>Culex</i> = 60	60	2	28.8	75
4 (Control)	<i>Anopheles</i> + <i>Aedes</i> + <i>Culex</i> = 60	60	30	29	79

Analysis

- Efficacy: N, N-Diechylbenzamide with Vitamin E and Almond, demonstrated consistently high repellent efficacy, with an average protection of 92.22% against the mixed mosquito population.

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- Environmental Influence: Despite a relative increase in humidity (75%) during Experiment 3, the landing count remained low, suggesting stable performance of the cream across varying humidity conditions.
- The control trial (Experiment 4) showed significantly higher mosquito landings (30), confirming the baseline susceptibility of exposed skin without treatment.

% Protection (Repellency): Using the formula:

Percent Protection = $(\text{Control} - \text{Treatment} / \text{Control}) \times 100$

- Exp 1: $(30 - 3) / 30 \times 100 = 90\%$
- Exp 2: $(30 - 2) / 30 \times 100 = 93.33\%$
- Exp 3: $(30 - 2) / 30 \times 100 = 93.33\%$
- Average Protection = $(90 + 93.33 + 93.33) / 3 = 92.22\%$

Conclusion

N, N-Diechylbenzamide with Vitamin E and Almond, demonstrated **strong and consistent repellency** against a mixed adult mosquito population (*Anopheles*, *Aedes*, *Culex*) under laboratory conditions. The formulation achieved over **92% protection**, effectively reducing mosquito landings compared to the untreated control. Its performance remained **stable under varied humidity**, highlighting its potential for practical use in real-world tropical environments.

Recommendations

- Conduct **field trials** under varied climatic and environmental conditions to validate laboratory results.
- Test **longer exposure durations** to evaluate residual repellent activity.
- Perform **comparative studies** with other commercially available repellents to benchmark efficacy.

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