

RESEARCH REPORT

Testing efficacy of Nilgiri & Lemongrass oil against different mosquito adult species density in Greater Noida

Overview

- **Title of the Report:**
Testing Efficacy of Nilgiri & Lemongrass oil on *An. Stephensi*, *Culex spp*, *Aedes aegypti* 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 study was undertaken to evaluate the performance of Nilgiri & Lemongrass oil, against adult mosquitoes of three major vector species—*Anopheles stephensi*, *Culex spp.*, and *Aedes aegypti*.

The objectives were to:

- Assess **repellency effectiveness** based on mosquito landing behavior.
- Examine **knockdown impact**, an additional benefit for a repellent product.
- Observe environmental factors (temperature and humidity) influencing mosquito activity.

Experiments were carried out on **12 August 2025** in Greater Noida under controlled laboratory conditions.

Summary

Across all three treatment replicates, Nilgiri & Lemongrass oil **demonstrated strong repellency**, reducing mosquito landings to **11–16 per trial compared to 32 in control** during a 60-minute exposure. In addition, Nilgiri & Lemongrass oil exhibited a **significant knockdown effect**, immobilizing **26–30 mosquitoes per replicate** (43–50% mortality). This dual benefit—**repellency plus knockdown**—highlights the potential of Nilgiri & Lemongrass oil as a natural and effective mosquito control solution.

Materials Used:

- Nilgiri & Lemongrass oil Mosquito Repellent
- Positive Control (e.g., DEET 10% standard repellent)
- Negative Control (no repellent)
- Adult female mosquitoes (3–5 days old, non-blood-fed)
- Human volunteers (18–50 years, healthy, with informed consent)
- Unscented soap, ethanol, and paper towels
- Timer/stopwatch
- Aspirator
- Lab PPE (gloves, lab coat, mask)

Methodology:

Mosquito Preparation:

- 60 healthy female mosquitoes were used per experiment.
- Mosquitoes were starved for 12 hours prior to testing.
- Observations included:
 - o Number of mosquito landings
 - o Number of probing attempts

Results:

Experiment No	Total Mosquitoes	Exposure Time (min)	Landing Catch	Knockdown	Temperature	Humidity
1	60	60	14	30	31.1	75
2	60	60	16	28	32.2	73
3	60	60	11	26	30.5	67
4 (Control)	60	60	32	00	28	68

Analysis

- **Repellency Performance:**
 - Landing counts in treatment replicates (11–16) were significantly lower compared to control (32 landings), demonstrating strong repellency.
- **Knockdown Impact:**
 - Despite being a **repellent**, Nilgiri & Lemongrass oil, exhibited a notable **knockdown effect**, immobilizing 26–30 mosquitoes per trial (43–50% mortality). This dual action (repellency + knockdown) increases its functional value.
- **Environmental Influence:**
 - Slight variations in temperature and humidity correlated with minor differences in mosquito activity, but efficacy remained consistently high across replicates.

Conclusion

Nilgiri & Lemongrass oil, proved to be an effective **dual-action product**, offering strong repellency while also delivering a significant **knockdown effect** against *Anopheles stephensi*, *Culex* spp., and *Aedes aegypti* adults. This combined functionality positions Nilgiri & Lemongrass oil as a natural alternative to chemical vaporizers with added benefits

Recommendations

- Conduct **extended duration tests** to determine residual effectiveness.
- Perform **semi-field and household trials** to validate results in real-life conditions.
- Explore **formulation optimization** to further enhance knockdown without compromising safety.
- Compare **cost-effectiveness and long-term protection** against leading synthetic vaporizers.

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