RESEARCH REPORT

Testing Efficacy of Bhutika, Nimba, Tailaparna oil against Different Mosquito Adult Species Density in Greater Noida

Overview

- **Title of the Report:**
  Testing Efficacy of Bhutika, Nimba, Tailaparna oil, on An. Stephensi, Culex spp, Aedes aegypti Adult Density in Greater Noida.
- **Principal Investigator(s):**
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Introduction

This study was undertaken to evaluate the performance of mosquito repellent formulated with **Bhutika, Nimba, and Tailaparna oils**, 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 **20 August 2025** in Greater Noida under controlled laboratory conditions.

Summary

Across all three treatment replicates, Bhutika, Nimba, Tailaparna oil, demonstrated moderate repellency, reducing mosquito landings to **22–29 per trial** compared to **32 in control** during a 60-minute exposure. Additionally, the Bhutika, Nimba, Tailaparna oil exhibited a **limited knockdown effect**, immobilizing **4–7 mosquitoes per replicate (7–12% mortality)**. Although the primary action is repellency, the knockdown effect suggests additional benefit.

Materials Used:

- 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	28	4	31	66
2	60	60	29	6	32	61
3	60	60	22	7	32.3	62
4 (Control)	60	60	32	00	31.2	67

Analysis

• Repellency Performance:

Landing counts in treatment replicates (22–29) were only slightly lower compared to control (32 landings), indicating moderate repellency.

• Knockdown Impact:

Bhutika, Nimba, Tailaparna oil, exhibited a minor knockdown effect, immobilizing 4–7 mosquitoes per trial (7–12% mortality). This suggests the formulation primarily acts as a repellent with limited insecticidal effect.

• Environmental Influence:

Temperature and humidity remained within 31–32.3 °C and 61–67%, showing negligible influence on efficacy variations.

Conclusion

Bhutika, Nimba, Tailaparna oil, provided moderate repellency and a limited knockdown effect against *Anopheles stephensi*, *Culex spp.*, and *Aedes aegypti* adults. While the product demonstrates potential as a natural mosquito control solution, its performance suggests the need for further optimization for higher efficacy.

Recommendations

- Improve formulation to enhance repellency and knockdown effect.
- Conduct extended duration tests to assess residual effectiveness.
- Perform semi-field and household trials to validate real-life performance.
- Benchmark against leading herbal and synthetic products for market positioning.

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