RESEARCH REPORT

Testing efficacy of Citronella, Eucalyptus, Lemongrass against different mosquito adult species density in Greater Noida

Overview

- **Title of the Report:**
  Testing Efficacy of Citronella, Eucalyptus, Lemongrass on different mosquito adult species 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 Citronella, Eucalyptus, Lemongrass, as herbal control agent against different mosquito adult species in four replicates including control, from Greater Noida. It also correlated adult mosquito density with environmental factors (temperature and humidity), and provided recommendations for sustained mosquito control. The dataset spanned 24-07-2025, covering treatment readings.

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. Citronella, Eucalyptus, Lemongrass, achieved a 68% landing catch on 24-07-2025 across five replicates, demonstrating initial efficacy.
Humidity (67 - 74%) and temperature (28.8°C–30.2°C) showed a moderate correlation in enhancing the efficacy of Citronella, Eucalyptus, Lemongrass.

Materials Used:

- Mosquito Repellent Patches
- Female mosquitoes (3–5 days old, non-blood-fed)
- Control patches (no active ingredients)
- Volunteers (with ethical clearance)
- Fabric (cotton, for indirect exposure testing)
- Timer/stopwatch
- Aspirator
- Insect-proof room with temperature and humidity control
- Thermo-hygrometer

Procedure:

Mosquito Preparation:

- 60 healthy female mosquitoes were used per experiment.

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- Mosquitoes were starved for 12 hours prior to testing.

Patch Application:

- Patches were affixed to volunteers' shirts or T-shirts.
- A consistent distance was maintained between patch placement and exposed skin.
- Patches were applied per manufacturer instructions.

Exposure and Observation:

- Mosquitoes were released in the room, and observations were made for 5 minutes at each interval.
- The following were recorded:
  Number of mosquito landings
  Number of probing attempts

Results:

Experiment No	Patches Used	Total Mosquitoes	Total Time (min)	Mosquito Landing Catch
Control	0	60	60	42
1	6	60	60	17
2	6	60	60	15
3	6	60	60	8

- Mean landing catch for control: 42
- Mean landing catch with patches: *(17 + 15 + 8)/3* = 13.3
- Overall reduction: approx. 68%

Analysis

- Control trials showed high exposure, with landing counts reaching up to 42**.**
- Use of 6 patches consistently reduced mosquito landings, averaging 13.3 landings.
- The repellent showed strong deterrent effects, though no knockdown was observed, indicating non-lethal repellency.

Conclusion

Citronella, Eucalyptus, Lemongrass mosquito repellent patches, made with Citronella, Eucalyptus, and Lemongrass oils, provided partial to significant protection against adult mosquitoes. While they did not achieve complete mosquito knockdown, the product demonstrated a clear dose-response relationship, with higher patch counts offering improved repellence.

Recommendations

- Conduct field trials under open-air conditions for real-world validation.
- Improve formulation for longer protection duration and increased repellency.
- Compare performance with other repellent brands for strategic product development.

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