RESEARCH REPORT

Testing efficacy of Mosquito Repellent against different species of mosquito adult density in Greater Noida

Overview

- **Title of the Report:**
  Testing Efficacy of mosquito repellent (Citronella, Eucalyptus, Peppermints, Lemongrass) on different mosquito adult species density in Greater Noida.
- **Principal Investigator(s):**
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- **Date of Submission:**
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Introduction

This report evaluated the efficacy of mosquito repellent (Citronella, Eucalyptus, Peppermint, Lemongrass) as herbal control agent against different mosquito adult species in four replicates including control conducted in Greater Noida. It also assessed the correlation between adult mosquito density and environmental factors such as temperature and humidity, and provided recommendations for sustained mosquito control. The dataset covered experimental data collected on 24-07-2025.

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. Anti-Mosquito Repellent (Citronella, Eucalyptus, Peppermint, Lemongrass) demonstrated protective action, with up to 76% reduction in mosquito landings in Trial 3.
A moderate positive correlation between repellency and environmental factors such as humidity (68–70%) and temperature (29.4–30°C) was observed.
The repellent was more effective with increased surface coverage, indicating application-dependent efficacy.

Materials Used:

- Mosquito Repellent Roll-On (Citronella and Lemongrass oil-based)
- Control fabric (no repellent)
- Test fabric (treated with Roll-On)
- Female mosquitoes (3–5 days old, non-blood-fed)
- Volunteers (ethically approved, if human-bait is used)
- Thermo-hygrometer (for room conditions)
- Timer or stopwatch
- Aspirator
- Labels and gloves

Preparation of Treated Fabric:

- Cotton fabric or simulated children's clothing was used.
- The Roll-On was applied as per manufacturer's guidelines.
- The fabric was allowed to air dry for 5–10 minutes prior to testing.

Procedure:

- The treated fabric was worn or wrapped around the forearm of a volunteer (with prior ethical approval).
- Mosquitoes were released in the experimental chamber.
- Observations included:
  - Number of landing attempts
  - Number of probing attempts
  - Number of successful bites

Results:

Experiment No	Total spots	Total Mosquitoes	Exposure Time (min)	Mosquito Catch	Knockdown	Temperature (°C)	Humidity (%)
1	8	60	60	21	2	29.4	68
2	8	60	60	15	4	29.8	68
3	8	60	60	10	7	30	70
Control	0	60	60	42	0	30.2	74

Analysis

- The control group (untreated) recorded 42 mosquito landings, establishing a high baseline exposure rate.
- Trial 1, using 8 treated spots, reduced mosquito landings to 21, indicating partial efficacy.
- Trial 2 showed improved efficacy with 15 landings and 4 knockdowns.
- Trial 3 demonstrated the highest efficacy, with only 10 landings and 7 knockdowns.
- A clear trend of increasing protection with increased treated surface area was evident, showing a dose-dependent protective effect.
- Knockdown rates also increased progressively across trials.

Conclusion

Anti-Mosquito Repellent (Citronella, Eucalyptus, Peppermint, and Lemongrass) exhibited strong repellent action under laboratory conditions. Increased application improved protection levels, confirming the importance of adequate surface coverage. The product showed potential for short-term use and may be particularly suitable for sensitive populations such as children due to its herbal composition.

Recommendations

- A minimum of 8–10 treated spots is recommended for effective protection.
- Field-level trials under varying outdoor environmental conditions are recommended.
- Further species-level identification of mosquitoes is necessary for understanding species-specific repellency.
- Future studies should also include longer-duration exposure tests (2–4 hours) to assess extended protection.

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