

## **OP 21 - Formulation of Herbal Cream Using Essential Oils of *Cymbopogon citrus* (Lemon grass) and Evaluation of Mosquito Repellent Activity against *Aedes aegypti*, *Anopheles stephensi*, *Culex quinquefasciatus***

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**Background:** *Aedes aegypti*, *Anopheles stephensi* and *Culex quinquefasciatus* mosquitoes are the major vectors for dengue fever, malaria, filariasis in Sri Lanka. The most of mosquito repellents presently available in the market are mainly prepared with active ingredients of synthetic origin and known to be harmful.

**Objectives:** Formulation of less toxic herbal cream and evaluation of in vitro mosquito repellent activity against *Aedes aegypti*, *Anopheles stephensi* and *Culex quinquefasciatus*.

**Methodology:** Oil in water emulsion based 10% w/w active ingredient cream was formulated by using lemon grass essential oils and evaluated for physical stability parameters (pH, odor, appearance, washability and colour) for 45 days at room temperature. The repellent efficacy of the cream was tested by trained panel at medical research institute in Sri Lanka. Briefly, 1 g of herbal cream formulated was applied on the dosal hand area (25 cm<sup>2</sup>) of the trained panel. The treated hand and untreated hand (negative control) were exposed to 100 caged, blood starved, laboratory bred female mosquitoes of three species and repellency test was performed for 300 minutes after every 30 minutes.

**Results and conclusions:** The formulated cream was found to be homogenous, semi-solid, washable and white color with pleasant odor and pH was in the range of 6 to 7. Total protection without sitting or biting of all three species of mosquitoes was recorded to be 240 minutes for the formulated cream. A commercial herbal cream was tested as positive control and its protection for mosquitoes sitting or biting was only 30 minutes. The results suggested that the cream formulated with *C. citrus* essential oils has the potential mosquito repellent activity and can be commercialized as a new, safe repellent product to prevent *Aedes aegypti*, *Anopheles stephensi* and *Culex quinquefasciatus* bites.

**Keywords:** *Aedes aegypti*, *Anopheles stephensi*, *Culex quinquefasciatus*, *Cymbopogon citrus*, mosquito repellent