# OVIPOSITION PREFERENCE OF *Aedes aegypti* MOSQUITOES IN MSAMBWENI SUB-COUNTY, KWALE COUNTY, KENYA

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## DECLARATION

I declare this thesis to be my original work and has not been presented for a degree award in any other University.

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## DEDICATION

I dedicate this thesis to my wife Agatha and my children Lewis, Nelis and Favor. Their support and advice have always been part of my decision-making process and I am a better man for it. With all of my heartfelt sentiment, I wish them many years of happiness.

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## ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| DENV | Dengue Virus. |
| DFV | Dengue Fever Virus. |
| KEMRI | Kenya Medical Research Institute. |
| MEI | Mean Egg Index. |
| OPI | Ovitrap Positivity Index. |
| SAS | Statistical Analysis System. |
| WHO | World Health Organization. |
| YFV | Yellow Fever Virus. |

## DEFINITION OF TERMS

**Data** Facts and statistics collected together for reference or analysis.

**Incidence** The total number of new cases over the number at risk.

**Outbreak** Occurrence of disease cases in excess of normal expectations.

**Ovitrap** Mosquito egg trap.

**Prevalence** Proportion of a population found to have a condition.

**Surveillance** Systematic collection, analysis and dissemination of health data for planning implementation and evaluation of public health

## ABSTRACT

*Aedes aegypti* is the primary vector of dengue fever virus (DENV) worldwide. Kenya has reported increased outbreaks of dengue fever along its coast region in the last decade, with a corresponding increase in abundance of *Ae. Aegypti.* Infusions made from organic materials have been shown to act as oviposition attractants for *Ae. Aegypti,* however, studies on locally suitable infusion materials are lacking. The current study assessed the suitability of four locally available materials as oviposition infusions for use in control of *Aedes aegypti* in sub-county, Kwale County, Kenya. A secondary objective of the study Msambweni was to identify *Ae. aegypti* preferred oviposition microhabitats. Oviposition infusion preferences of four infusions made from leaves of banana, grass, neem, and coconut were assessed in laboratory, semi-field and field conditions. Ovitrapping in wall, grass, bush and banana microhabitats was done in 10 houses, each in urban (Ukunda) and rural (Msambweni) households to determine suitable oviposition microhabitats. Descriptive analyses were used to compare ovipositional responses among the different infusions and microhabitats. Overall, the highest ($P<0.0001$) oviposition responses were observed from banana infusion followed by neem ($P<0.0001$) and grass infusions ($P<0.0001$). Oviposition responses in neem and grass infusion were comparable. Coconut infusion resulted in the least oviposition response. Although female *Ae. aegypti* did not show preference to any microhabitat, the oviposition activity across all the microhabitats were highly enhanced by use of the organic infusions. However, the mean number of eggs laid in banana and bush microhabitats were higher (42.61±2.05 and 35.87±1.71respectively) compared to grass (32.55±1.66) and wall microhabitats (31.05±1.66). Banana leaves, mixed grass and neem tree leaves are suitable materials for oviposition infusions. Using these infusions, gravid mosquito could be attracted to oviposition sites that are laced with an insecticide to kill the eggs. Additionally, the small pockets of banana plantings should be important targets for integrated vector control programs.