

PERMANENT REFERENCE

USE OF SKATOLE AND STRAW INFUSION IN
A SITE SPECIFIC STUDY OF THE OVIPOSITIONAL BEHAVIOUR OF
Culex quinquefasciatus SAY IN BATTICALOA

By
KALPANA ARUCHUNAN

A research report

Submitted in partial fulfillment of the
Special degree course in zoology

2002



FSC 28
Project Report
Library - EUSL

47485

PROCESSED
Media Library, EUSL

APPROVED BY

Dr. Meena Dharmaratnam
(Supervisor)
Senior Lecturer
Department of zoology
Faculty of Science
Eastern University, Sri Lanka

Mrs. C. Devadasan
(Head)
Senior Lecturer
Department of zoology
Faculty of Science
Eastern University, Sri Lanka

.....*Meena*.....

Date: 12/9/2002

.....*Chandru*.....

Date: 1.7.9/2002

ABSTRACT

Oviposition in mosquitoes is mediated by physical and chemical cues. The role of chemicals in the selection of ovipositional site has been studied with the aim of designing traps of both surveys and pest management programmes. Gravid females *Culex quinquefasciatus* Say is attracted by chemicals from leaf infusions, polluted water and an oviposition pheromone. Skatole (chemical) major component of the grass infusion. Previous field studies with aim of designing traps have been conducted in Africa. The aim of the present study was to test the effectiveness of skatole and leaf infusion in two possible breeding sites: latrine and drinking well and a non-breeding site in Batticaloa. A Preliminary study was also conducted to screen the effectiveness of locally available leaf material and to test the optimal concentration and days of fermentation of the straw, on ovipositional behaviour of mosquitoes (which elicited the highest number of egg clusters). Only one species *C. quinquefasciatus* oviposited. In the preliminary study paddy straw (*Oriza sativa*) infusion elicited the highest number of egg laying response than the other leaf infusion tested: mango (*Mangifera indica*), *Cycas* spp, and wild gardenia (*Gardenia latifolia*). Further tested on straw infusion indicated that the ovipositional response was highest for 8 days of fermentation than 6, 4, and 2. 100% concentration was the most effective in eliciting ovipositional response. Ovipositional response was higher in the possible breeding sites: latrine and well than the non-breeding site. Skatole and straw infusion had a synergistic effect than when individually tested. In conclusion, it could be said that skatole and straw infusion can be used in designing traps for either surveys or pest management. The recommended sites for mosquito surveillance are the latrines and wells in a domestic condition.

TABLE OF CONTENTS

	Page No
ABSTRACT	i
ACKNOWLEDGEMENT	ii
LIST OF FIGURES	iii
1.0. INTRODUCTION	1
1.1 GENERAL	1
1.2 MOSQUITOES IN SRILANKA	2
1.3 LIFE CYCLE OF MOSQUITOES	3
1.4 BLOOD FEEDING BEHAVIOUR OF MOSQUITOES	5
1.5 PERIODICITY OF MOSQUITO BEHAVIOUR	6
1.6 OVIPOSITION OF MOSQUITOES	7
1.6.1 PREFERRED OVIPOSITION SITES	8
1.6.2 INFLUENCE OF ENVIRONMENTAL FACTORS IN OVIPOSITION SITE SELECTION	9
1.6.3 ROLE OF SEMIOCHEMICALS IN OVIPOSITION SITES	10
a. GRASS INFUSION	11
b. SKATOLE	11
c. OVIPOSITION PHEROMONE	13
1.7 AIM	14
2.0 MATERIALS AND METHODS	17
2.1 THE RESPONSE OF CULEX MOSQUITOES TO DIFFERENT TYPES OF LEAF INFUSIONS	17
2.2 THE EFFECT OF DAYS OF FERMENTATION OF STRAW INFUSION IN OVIPOSITION	18
2.3 THE EFFECT OF DIFFERENT CONCENTRATIONS OF STRAW INFUSIONS IN OVIPOSITION	19
2.4 THE EFFECT OF STRAW INFUSION, STRAW INFUSION + SKATOLE AND SKATOLE AND SITES ON OVIPOSITION OF MOSQUITOES	20
3.0 RESULTS	22
3.1 THE RESPONSE OF CULEX MOSQUITOES TO DIFFERENT TYPES OF LEAF INFUSIONS	22
3.2 THE EFFECT OF DAYS OF FERMENTATION OF STRAW INFUSION IN OVIPOSITION	23
3.3 THE EFFECT OF DIFFERENT CONCENTRATIONS OF STRAW INFUSIONS IN OVIPOSITION	26
3.4 THE EFFECT OF STRAW INFUSION, STRAW INFUSION + SKATOLE AND SKATOLE AND SITE ON OVIPOSITION OF MOSQUITOES	26
4.0 DISCUSSION	31
4.1 INFLUENCE OF LEAF INFUSION ON OVIPOSITION OF <i>CULEX QUINQUEFASCIATUS</i>	31
4.2 THE INFLUENCE OF FERMENTATION PERIOD AND CONCENTRATION OF LEAF INFUSION IN OVIPOSITION	33
4.3 THE SYNERGISTIC EFFECT OF SKATOLE AND SITE SPECIFICITY	34
4.4 MANAGEMENT OF MOSQUITOES	36
4.4.1 MOSQUITO CONTROL PROGRAM	36
5.0 CONCLUSION	38