FINAL REPORT

RE: FDACS Contract # 012016
FAMU EIT # 001079

Report Period: September, October, November, 2007
Project Deadline: December 31, 2007

Project Title: Statewide Monitoring of Mosquito Response to Organophosphates

Principal Investigator: Jack Petersen, Ph. D.

RESEARCH PLAN

The objective of the proposed study is to compare the response of larval mosquitoes when exposed for 24 hours to various concentrations of organophosphate. Both temephos and naled will be tested. Field collected mosquito larvae will be compared to laboratory reared susceptible mosquitoes of the same species. At least 2 laboratory colonies have been tested by bioassay and determined to be susceptible: *Oc. taeniorhynchus* lab colony, Lee County MCD and *Oc. taeniorhynchus* lab colony PHEREC. These will serve as the baseline data.

DETAILED METHODOLOGY

We proposed to- [NOTE: proposed timeline is indicated for each objective]

(1) Field collect 3rd instar mosquito larvae. An alternative is to field collect blooded female mosquitoes, allow the females to oviposit in the laboratory, and rear the larvae in the lab under controlled conditions of temperature and nutrition.
[proposed timeline: 1st six months of the project]
(2) Measure dose response curves of these larvae to serial dilutions of organophosphates, temephos, malathion, chlorpyrifos, naled.
[proposed timeline: 1st six months of the project]
(3) Perform statistical analysis using SYS STAT PROBIT ANALYSIS (SAS Institute 2005).
[proposed timeline: months 7-9 of the project]
(4) Compare field results with results from a susceptible laboratory colony.
[proposed timeline: months 7-9 of the project]
(5) Make recommendations for long term strategies for mosquito control based on the susceptibility profiles obtained.
[proposed timeline: month 10 of the project]
(6) Prepare final report and write manuscript for journal publication.
[proposed timeline: months 10-12 of the project]

Results for the Reporting Period

Regional Workshops

A follow-up workshop was held at Jacksonville Mosquito Control Division on Wednesday afternoon and all day Thursday, November, 15 and 16, 2007, following the FMCA Annual Fall meeting in Jacksonville. I worked with Marah S. Clark to correct several inaccuracies in the powerpoint presentation that has been posted to the PHEREC web site: http://www.pherec.org/mls/database/fmca2007.ppt

Analysis of Dibrom by Gas Chromatography

A sample of 0.5 ug/ml of naled was prepared for gas chromatography. The research question we were asking was: Assuming that Dibrom Concentrate contains 14.1 pounds per gallon, a dilution prepared in hexane should yield 0.5 ug/ml when tested by gas chromatography. These results were reported to the Florida Mosquito Control Association at the Annual Fall Meeting, Jacksonville, Florida, November, 2007.

Keith Marshall and Jack Petersen prepared a $1:10^{-6}$ dilution of Dibrom 14 in hexane. This preparation was given to Cate Brock, technician in Dr. Harry Zhong's chemistry lab at PHEREC.

Naled analysis was carried out by Electron Capture Detector (ECD) primary and Thermionic Detector (TSD) secondary.

A reference standard was prepared using analytical grade naled.

The sample was prepared on the afternoon of 08/21/2007 and the sample was run at 9:46 p. m. that evening.

The results showed recovery of 0.4451 ug/ml of naled.

The recovery of 0.4451 ug/ml is considered corroboration of out assumption that DIBROM CONCENTRATE contains at least 14.1 pounds per gallon.

We will continue to follow the standard protocol for Dibrom Concentrate, that is 25 ug/ml continues to be the recommended diagnostic dose.

REPORTS TO CLIENTELE

Oral Report of the outcomes of this FDACS-funded grant. On Insecticide Resistance Testing at the Jacksonville Mosquito Control Division by Marah S. Clark. This PowerPoint Presentation is available on-line at URL http://www.pherec.org/mls/database/fmca2007.ppt

A poster presentation of outcomes derived from this FDACS-funded project was presented at the Annual Meeting of the Entomological Society of America, San Diego, California, Wednesday, December 12, 2007. The title of this poster: State-Wide Monitoring of Mosquito Response to Chemical Insecticides in Florida. This poster presentation has been web-posted at URL
http://www.pherec.org/mls/database/ESA2007.pdf

A 15-minute oral presentation of outcomes of this FDACS-funded research was presented at FAMU on October 25, 2007 by Keith Marshall (FAMU B.S. student) and Dr. Jack Petersen, "Using Bottle Bioassays to Detect Pesticide Resistant Mosquitoes." The URL of this slide presentation is
http://www.pherec.org/mls/database/CESTAresearchFORUM.ppt

CONTINUING OUTREACH EFFORTS STEMMING FROM THIS GRANT

We report the planning of the Insecticide Resistance Workshop at the Dodd Short Courses, January 2008. Course W. Measuring Larval Insecticide Resistance scheduled for Thursday, January 31, 2008 08:00 a.m. to 5:00 p.m.

The deadline for this project is December 31, 2007, however, our extension/outreach of this FDACS project will continue as a hands-on workshop at the FMCA Dodd Plenary Short Courses, Ocala, Florida, January 2008.

Submitted by,
Jack Petersen
December 20, 2007