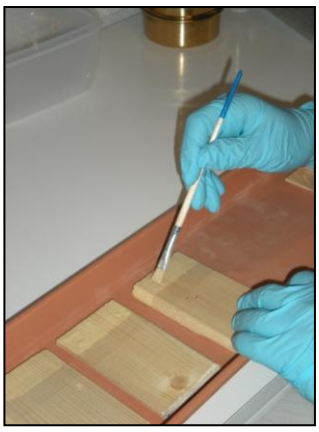
USA Technical Center

PUBLIC HEALTH ENTOMOLOGY



SynTech Research, Inc.

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INTRODUCTION:

The main Entomology Facility of SynTech Research, Inc. is located at its technical center in Sanger, California. The center provides complete R&D services for product development of insecticides, bio-pesticides and insect growth regulators used for crop protection and public health. Our services include
1) placement and oversight of testing in the laboratory, greenhouse, semi-field and field
2) programme design, management, consultation, recommendations, data analysis and report writing.
Our testing capabilities range from simple bioassays to determine efficacy and comparison of test materials to full-fledge field studies anywhere in the USA and several key agriculture regions of the world. We collaborate with Universities and governmental agencies in the USA and aboard.

PUBLIC HEALTH:

The services we provide in the public health sectors include:

A. **Laboratory rearing and maintenance of insect colonies**. We rear six species of cockroaches and one species each of ants and bees. Currently, we purchase mosquito larvae and adults from a reliable insect supplier. However, we are capable to rearing our own mosquitoes if needed.
B. **Insect Collections and Identification**: We collect insects from various locations within the state of California and other states in the USA for resistance monitoring and detection, and provide insect identification service.
C. **Insecticide Susceptibility Tests**: We have environment-controlled laboratories on-site as well as environmental chambers to perform bioassays. We follow the WHO, OECD, and EPA guidelines to perform these tests. The tests include topical applications using a micro-applicator syringe, tarsal contacts assays in glass jar and filter papers, bait and choice tests, and aerosol or spray studies in wind tunnels.
D. **Residue Assays**: We test the residual effects of the test chemicals on surfaces such as glass, concrete, metal, wood, tiles, mud, and synthetics.
E. **Detection of Resistance**: We can perform LT50, LD50 and KT50 to compare the test substances. Also we perform (in collaboration with university labs.) PCR to detect the *kdr* mechanism.
F. **Semi-field Testing**: We perform semi-field testing on ants, flies, mosquitoes and cockroaches to determine both efficacy and the degree of resistance.
G. **Data Analysis and Report Writing**: We use appropriate statistical analyses and have a standard reporting system with raw data, full data analysis, methodologies used in detail, summary of the results with appropriate graphs and pictures, and recommendations based on the results.

Mosquito Testing Capabilities

Laboratory Studies

1. **Cultures**
   a. We have continuous source of two species of susceptible strains of mosquitoes:
   b. *Aedes aegypti* (yellow fever mosquito)
   c. *Culex quinquefasciatus* (southern house mosquito)

2. **Laboratory Studies with adult mosquitoes**
    a. Bioefficacy tests on adult mosquitoes
    b. Topical applications using micro-applicators
    c. Tarsal contact studies on treated filter papers
    d. Aerosol or spray studies using a glass jar/small wind tunnel
    e. Residue tests
    f. Contact assays on fibers and fabrics
    g. Contact assays on wood, concrete/cement, plaster, glass, mud walls, and metal surfaces
    h. Repellency studies

3. **Laboratory Studies with mosquito larvae**
    a. Susceptibility tests of the insecticides, insect growth regulators and biocides

Semi-field Studies

a. Residual activities of indoor spraying, use of impregnated mosquito-nets for adults
b. Larvicidal effects in the pools of water/breeding sites

Types of Tests

a. Determination of LC50, LD50, LT50, KT50 (knock down time)
b. Dose mortality curves
c. Single dose Diagnostic tests (WHO 1981) to separate susceptible from resistant strains
d. Resistance Ratio, Cross-Resistance.
e. We follow the official guidelines of the WHO, OECD, and EPA.

Duration of each test

a. Normally, one - two weeks- some can be completed within 72 hours

Staff

Highly trained personnel listed below perform the laboratory and field testing with the assistance of several interns. The program lead, Dr. Rocky Kuenen, worked with mosquitoes in Nepal for her master's degree and has twenty years of Entomology/public Heath work experience; two other biologists have entomological experience ranging from three to five years.

Dr. Rocky Kuenen - Entomology Team Leader/Global Public Health Lead. PhD in Entomology, University of Massachusetts, Post-doctorate at Cornel University and the University of California, Berkeley
Mr. Jose Gutierrez - Research Biologist. M.S. in Biology (Entomology), California State University
Mr. Joseph Lerda - Research Associate. B.S. in Plant Science, California State University
Ms. Amanda Minyard - Research Assistant. Associate Degree in Agriculture, Reedley College

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