Automated Detection & Recording of Mosquitoes

Recorded in the eaves of an African hut

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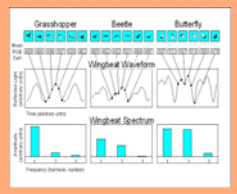
FAST-ID™ unit (version 1.0)



How does it work?
Insects with different morphology and flight behavior produce optically-sensed waveforms with different harmonic patterns.

How FAST-ID Works

APTIV Inc's FAST-ID™ technology is designed to **count and identify individual flying insects**. When an insect flies between a light source and photosensor, a flight signature can be captured by a datalogger. Individual insects are **automatically identified** by comparing their flight signature with a library of signatures using a statistical classifier or an artificial neural network.

FAST-ID™ consists of three components:
- a light source (sun or artificial)
- a photosensor and digital data acquisition system
- a signal processing method to extract signatures

These are integrated into a single **compact, light-weight and field-proven unit**, together with connection hardware to facilitate both transfer of stored data to, or on-time data collection by, a laptop computer or recording device.

FAST-ID™ in Kenya

The Purpose

A field trial in Mbita, Kenya in January 2006 tested FAST-ID™ a prototype **malaria early warning system**. The aims of this field trial were to:

1. Build a **library of recorded flight signatures** for the principal mosquito species that vector malaria in western Kenya
2. Demonstrate the capability to **automatically identify malaria vectors** using their flight signature
3. Demonstrate the concept of **sentinel huts**
4. Demonstrate the capability to **monitor vector behavior** in the field

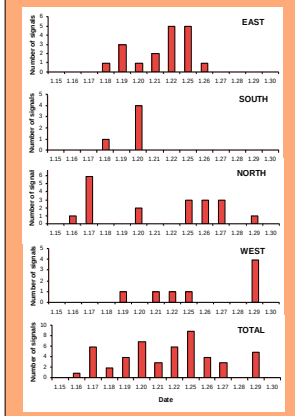
The Study

A typical village hut in Lwanda, Kenya was fitted with the FAST-ID™ sensor system. Each wall was fitted with a FAST-ID™ sensor and infrared light source to monitor mosquitoes, entering through the eave gaps, as they passed through a sensed area that ran the length of the wall. The FAST-ID™ unit, including an IR illuminator, was activated at sunset (about 1800 hours) and turned off at sunrise (about 0600 hours). Recordings in this hut were undertaken every night for almost three weeks. Individual mosquitoes were recorded flying through the eaves on several different nights.

What's ahead for FAST-ID™ :

- Product design of **an engineered, integrated unit** (analyze power & user needs)
- Field deployment, demonstrating a **successful sensor network**
- Genera or species? Determine the **degree of separation needed**
- **Cooperators in Africa and other countries** to generate a library of reference species signatures and increase the FAST-ID™ signal database

This is the first report of **recorded, unattended mosquito flight activity** in a village hut.



Mosquito activity monitored in 12 foot space on all four sides of village hut.

The huts were located in the village of Lwanda, about 12 miles from the town of Mbita, Kenya, on the coast of Lake Victoria.

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Lwanda Village hut with FAST-ID™ installed under the eaves

Aligning the light beam installed on the eaves of the village hut

Downloading data in the experimental huts

The FAST-ID™ system installed on the eaves of the experimental hut

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