Guiding Vector Control Through Community Entomological Surveillance: 
A Workshop for Community Mosquito Collectors

Presenter

Date

U.S. President’s Malaria Initiative
Introductions

• Your name
• Village or community
• Why you decided to work as a Community Mosquito Collector
• One interesting fact about you that others don’t know
Workshop Objectives

- Explain the importance of entomological surveillance in controlling malaria
- Identify the two main malaria-carrying mosquitoes and how they are different from other Anopheles mosquitoes
- Explain how to collect indoor resting mosquitoes using pyrethrum spray catch (PSC) or Prokopack aspirator
- Demonstrate the use of the CDC Miniature Light Trap to collect adult mosquitoes
• Demonstrate the use of dippers and pipettes to collect larvae
• Explain how to rear larvae to adult mosquitoes
• Explain how to correctly fill out data collection forms for larvae and adult mosquitoes
• Explain how to correctly fill out required collection forms for larvae and adult mosquitoes
• Describe how to label and preserve adult mosquitoes for further species identification or laboratory analysis
Session 1:

MALARIA AND YOUR ROLE
By the end of this session, you will be able to:

- State key facts about malaria
- Explain how malaria is transmitted from person to person
- Analyze the factors that ensure effective mosquito control
- Explain how your role will support effective mosquito control
Person-to-person transmission of malaria

1. First infected person
2. First infected mosquito

Infected liver cells
Infected red blood cells

Malaria Transmission Cycle

3. Second infected mosquito
4. Second infected person

From: https://www.ausmed.com/cpd/articles/malaria
Entomology: The scientific study of insects

Entomologist: A scientist who studies insects
What is a vector?
**Community Entomological Surveillance**

**Community Mosquito Collectors**
- Collect mosquitoes/larvae
- Record data on collection form
- Identify mosquitoes
- Transfer data forms & mosquito samples to district malaria focal point

**District Malaria Focal Point**
- Supervises and trains
- Identifies villages
- Distributes supplies/materials
- Verifies identified mosquitoes
- Performs quality control

Village A ➢ Village B ➢ Village C
Session 2:
MOSQUITO LIFECYCLE
By the end of this session, you will be able to:

- Describe how scientists organize animals into groups
- Describe the mosquito lifecycle
- Explain the differences between the eggs of *Anopheles*, *Aedes*, and *Culex* mosquitoes
- Explain the difference between the larvae of *Anopheles*, *Aedes*, and *Culex* mosquitoes
- Visually identify *Anopheles* mosquito larvae
- Describe habitats where *Anopheles* mosquitoes prefer to lay their eggs
All of us in this classroom:

- **Kingdom**: Animalia
- **Phylum**: Vertebrata
- **Class**: Mammalia
- **Order**: Primates
- **Family**: Hominidae
- **Genus**: Homo
- **Species**: sapiens

A malaria-carrying mosquito:

- **Kingdom**: Animalia
- **Phylum**: Arthropoda
- **Class**: Insecta
- **Order**: Diptera
- **Family**: Culicidae
- **Genus**: Anopheles
- **Species**: gambiae
Mosquito lifecycle

Egg → Larva (L1 → L2 → L3 → L4) → Pupa → Adult

Terrestrial → Aquatic
Aedes breeding locations
Culex breeding locations
Anopheles breeding locations
Anopheles eggs
Culex and Aedes eggs

Culex

Aedes

https://mosquitoreviews.com/learn/mosquito-eggs
Anopheles larvae
Culex and Aedes larvae
Session 3:

ADULT MOSQUITOES
By the end of this session, you will be able to:

- Describe the anatomy of a mosquito
- Distinguish between a male and female mosquito
- Describe the features of an adult Anopheles mosquito used to distinguish them from other commonly found mosquitoes
- Differentiate between female Anopheles, Aedes and Culex mosquitoes
- Determine the correct Anopheles mosquito blood digestion stage
Adult mosquito

- Head
- Thorax
- Abdomen
- Proboscis (to suck blood)
Anatomy of a mosquito

https://micrognome.priobe.net/2010/04/magnificent-mozzies/
Female mosquitoes

Diagram showing the anatomy of a female mosquito, including parts such as Head, Thorax, Abdome, Legs, Proboscis, Antenna, Wing, Foreleg, Midleg, and Hindleg.
Female vs male *Culex* mosquitoes
Female vs male mosquitoes
Female vs male *Anopheles* mosquitoes
How do these differ?

Culex Adult

Aedes Adult
Differences between Anopheles, Aedes, and Culex

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<th>Aedes</th>
<th>Culex</th>
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Identifying *Anopheles* mosquito blood digestion stages

Unfed

Freshly fed

Half gravid

Gravid
Session 4:

REARING MOSQUITOES FROM LARVAE TO ADULT