

A person wearing a light-colored uniform and a cap is using a sweep net in a wooded area. The background is a dense forest with many thin trees. The person is looking down at the net, which is held over the ground. The overall image has a reddish-orange tint.

Standard Operating Procedure for performing sweep net sampling of host-seeking mosquitoes

Effective Date: 6 April 2022

SOP #: SNH-2021



PACMOSSI
Pacific Mosquito Surveillance
Strengthening for Impact

Scope

This Standard Operating Procedure (SOP) outlines the materials and processes required to perform sweep net sampling of host-seeking adult mosquitoes.

Overview

Description: Sweet nets can be used to capture mosquitoes that are attracted to a host and are flying in the immediate vicinity. Human-baited sweep netting involves simply walking into a mosquito harbourage site and waiting for the mosquitoes to come to you. This method is effective for species such as *Aedes albopictus* which are aggressive biters.

Target species and physiological states: Captures host-seeking adults of both sexes and many species. Note, that *Aedes* males are often captured as they congregate around hosts in search of female mates.

Entomological surveillance indicators: Adult vector occurrence, density as well as adult vector behaviour (human biting rate, biting time, biting location).

Advantage: The equipment and supplies are inexpensive and portable. The mosquitoes are captured before they have a chance to bite the host.

Disadvantage: This method is labour intensive and requires trained staff. There is a low risk that field staff may become infected with mosquito-borne diseases.

Sampling period: Sweep net collections are usually conducted for a standardised time period or a fixed number of sweeps. When sampling *Aedes*, collections are often standardized to 5 or 10 minutes or 30 to 50 sweeps per sampling station.

Data: Total number of host-seeking mosquitoes per sampling effort (by species and sex). When necessary, field data is merged with the results of subsequent laboratory analyses.

Materials

- Sweep net
- White sight cloth (1 x 1.5 m)
- Consent form (optional)
- Timer (optional)
- Collection cups
- Data collection form/digital device
- Pens/pencils/markers
- Oral aspirator
- Cooler box
- Adulticide (optional)
- Labels

Product description

The ideal mosquito sweep net should consist of thin aluminium handles with circular (~38 cm diameter) frames and nets made from mosquito mesh. When sampling mosquitoes, it is recommended to use a mesh that you can see through, to ensure that the sampled mosquitoes are visible.

Location of sampling stations

1. Sweep net collections can be performed in a variety of locations, and usually outdoors.
2. The collector should be positioned near vegetation or an area where mosquitoes are likely to be resting.
3. The location of sampling is always negotiated with the owner of the property. Ensure that the owner is happy with the location of where sampling will be conducted.

Sampling procedure

1. First, choose a method for standardising the collections: either a set number of sweeps (e.g. 100 sweep) or a set time period (e.g. 10 minutes).

2. Walk to the sampling station, situated in an area with cool shade and surrounded by vegetation where mosquitoes are likely to rest.

3. Lay a light-coloured sight-cloth on the ground in front of you and look down and all around you to identify mosquitoes flying around you or landing on your legs. The light-coloured cloth provides a backdrop against which mosquitoes can be more easily seen.



4. **Begin to sweep the net back and forth and ensure you maintain a continual motion otherwise when you stop the mosquitoes may fly out of your net.**



5. **Stop periodically (e.g. every 10-20 sweeps) and quickly fold the end of the net so that the mosquitoes caught in the back of the net are unable to escape.**

6. **Collect the mosquitoes from inside the net by either:**

a. **Killing the mosquitoes:**

- i. Pre-treat the sweep net with an adulticide so that captured mosquitoes are knocked-down or killed.
- ii. Place the folded section into a plastic bag with a ball of cotton wool soaked in chloroform for 1 - 2 minutes.
- iii. After mosquitoes have been knocked down, tip them into a small white container and transfer into a storage container using forceps

b. **Keeping the mosquitoes alive:**

- i. Aspirate the mosquitoes directly from the inside of the sweep net using an oral aspirator.
- ii. Place the mosquitoes directly into collection cups.



7. **Temporarily store the mosquitoes in labelled collection cups until processing and long-term storage. For further details see [SOP# MOS-2021](#).**

Additional notes:

- If pre-treating the sweep net with an adulticide, ensure that the mosquitoes are not resistant to the active ingredient.
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- Wear long clothing covering the arms and legs to prevent mosquito bites.
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- In heavily infested areas, the collector can also wear repellent to prevent mosquitoes from landing and attempting to feed.
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- The sweep-net method is used in a variety of ways to sample a wide range of insects, some net designs and procedures might not be suitable for sampling host-seeking mosquitoes.
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Videos

To watch a video of how to use sweep nets to sample host-seeking mosquitoes go to:

- PacMOSSI Performing sweep net sampling of host-seeking mosquitoes – <https://youtu.be/F8aSAgkyyUs>

Human ethics

Where human ethics approval is required and granted, participants performing sweep net collections of host-seeking mosquitoes will be recruited following standard informed consent procedures. The potential risks and benefits of mosquito sampling will be discussed verbally in the local language. It will be explained that participation in host-seeking mosquito collections could expose them to potentially infectious mosquito bites. Collectors will wear topical repellent and long clothing to protect them from mosquito bites. If in a malarious area, collectors will be given anti-malarial drugs to prevent them from becoming infected with malaria.

For further details on human ethics see [SOP# MOS-2021](#).

Safety/Risk assessment

Your workplace may require you to complete a risk assessment prior to conducting field work. There are a range of risks to which field workers could be exposed, and when sampling with sweep nets may include:

- Mosquito transmitted infections
- Chloroform
- Dog bites

For further details on safety and risk assessments see [SOP# MOS-2021](#).

References

Silver, J.B. (2008) 'Mosquito ecology: field sampling methods.' 3rd edition; Springer: New York.

Citation

Kyran Staunton, Tanya L Russell, Thomas Burkot 2022. Standard Operating Procedure for performing sweep net sampling of host-seeking mosquitoes. protocols.io
<https://protocols.io/view/standard-operating-procedure-for-performing-sweep-b9mir44e>

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