

# Standard Operating Procedure for collecting resting mosquitoes with the Prokopack aspirator

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**SOP #: PRO-2021**

Image: Gonzalo Vazquez Prokopec.



**PacMOSSI**  
Pacific Mosquito Surveillance  
Strengthening for Impact

# Scope

The purpose of this Standard Operating Procedure (SOP) is to outline the materials and processes required to collection of resting adult mosquitoes using a Prokopack aspirator.

## Overview

Description: The Prokopack aspirator is a type of battery powered aspirator that is used to collect resting adult mosquitoes. The Prokopack was initially designed and trailled by Vazquez-Prokopac et al. (2009) to collect indoor resting *Aedes aegypti*. The Prokopack can be used both indoors and outdoors and to collect mosquitoes resting in both natural and artificial shelters.

Target species and physiological states: Captures resting adults of both sexes and many species.

Entomological surveillance indicators: Adult vector occurrence, density and resting location.

Advantage: The Prokopack is relatively light-weight and portable.

Disadvantage: The Prokopack is labour intensive to use and requires trained staff, can be difficult to find resting mosquitoes, difficult to standardise (especially outdoors) due to differences between resting sites.

Sample period: Collections should take place during period of minimum flight activity. For *Aedes* mosquitoes, preferably from mid-morning to early afternoon; for *Anopheles* mosquitoes, preferably in the early morning. The collection period for each sampling station should be standardised. For example, searches should be standardised to 10 minutes per house.

Data: Total number of resting mosquitoes per sampling effort (by species and sex).

## Materials

- Prokopack aspirator
- Oral aspirator
- Collection cups
- Rubber bands
- Cotton wool
- Mesh for cups
- Torches
- Batteries for torches
- Pencil/pen/markers/scissors
- Data collection form/digital device
- Battery (12 v)
- Universal automatic 5 amp charger
- Masking tape
- Timer
- Extension pole (optional)
- Box for transporting samples

# Trap assembly

## 1. Gather trap components.



## 2. Attach the battery to the white electrical cables from the suction device and secure the connections.

- a. Note if the fan is blowing and not sucking when turned on the cables need to be connected to the opposite battery terminals.



## 3. Screw the handle into the suction device.



## 4. Insert the collection cup in the aspirator - mesh end first.

- a. Note that the cup is loose when device is turned off, but will be held securely in place when the Prokopack is turned on.



**5. Secure the battery in the backpack.**



**6. Turn on the aspirator using the black switch on the white cables.**



*Additional notes:*

- If desired, extend the aspirator with an extension pole. When the aspirator is not extended store any excess electrical cable in the backpack.
- A 12 Amp hour battery should last 4 hours (John W. Hock).
- Head torches are very useful as they provide a hands-free solution. People have used red lens (~680 nm) which is considered invisible to mosquitoes and therefore does not impact behavior.

# Location of sampling stations

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1. The Prokopack can be used both indoors and outdoors and to collect mosquitoes resting in both natural and artificial shelters.
2. The location of the sampling stations will depend on the target species. For example:
  - a. *Ae. aegypti* typically rest indoors, especially in bedrooms and dark places such as clothes closets and other hidden sites, usually under 1.5 m in height, whereas
  - b. *Ae. albopictus* and *Ae. polynesiensis* often rest in vegetation and natural harbourage sites close to households.
3. Remember the local vector population may not primarily rest in the “typical” sites due to behavioural changes.
4. If aspirations are performed for regular monitoring of adult populations at fixed time intervals, consistently use the same sampling stations for each collection.

# Collecting resting mosquitoes

1. **Before commencing collections, identify survey sites and obtain consent from the occupants.**
  - a. Explain the study to occupants and describe the information on the informed consent form. If the occupants provide consent, ask them to sign the consent form.
  - b. The head of household must be informed not to do anything that will repel mosquitoes on the night before collection, such as smoking inside the house, using repellents or spraying aerosol insecticides.

2. **Prepare equipment:**

- a. Organise and label collection cups. Ensure that there is separate cups for each collection effort.
- b. Assemble and turn on the Prokopack, as per above.



Image: Gonzalo Vazquez-Prokopac

3. **Systematically collect resting mosquitoes from the sampling station.**

- a. Move the aspirator back and forth at approximately 1 meter per second. Keep the mouth of the aspirator within 15 cm of the surface.
- b. Mosquitoes seen flying should also be collected.



Image: Gonzalo Vazquez-Prokopac

4. **As soon as sampling is completed, put the lid on the collection cup before turning the unit off.**



Image: Gonzalo Vazquez-Prokopac

5. **Transfer the mosquitoes into labelled collection cups using oral aspirators. A single collection cup can be used per sampling station. Temporarily store the mosquitoes in labelled collection cups until processing and long-term storage. For further details see [SOP# MOS-2021](#).**

# Process for collecting mosquitoes indoors

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1. Mosquitoes must be searched for and collected in all rooms where technical field personnel are permitted to enter; noting that collections in the bedrooms, living room, bathroom and kitchen are to be prioritised.
2. For routine surveillance, it is recommended that the collections are made in the same type of rooms (guaranteeing at least 2 rooms: bedrooms and living room) and at the same time of day by the same operators for each collection effort.
3. To collect mosquitoes in each house, firstly close all the window and doors before starting. Then repeat the following process for each room:
  - a. Sample the walls by moving the aspirator vertically. Start near the door and move clockwise to search the entire room. If targeting *Aedes aegypti*, maintain the head of the vacuum <1.5 m on the wall.
  - b. Next, sample the ceilings by moving the aspirator horizontally.
  - c. Lastly, aspirate under, behind of inside furniture and other fixed or hanging objects. Look preferably for dark objects. Closets, wardrobes in sleeping areas, behind or between hanging clothes, are often very productive sites for capturing resting adults.
  - d. Collections should always start from the back rooms and will end in the front rooms (usually where the entrance door is). When the home has two or more floors, start on the upper floor and end on the lower floor. In all cases, always follow a sequence from left to right.
4. It is recommended to collect for 10 minutes (approx. 2 minutes for each room ~10 m<sup>2</sup>) in each house, but adjusting the time according to the size of each room (few seconds in bathrooms but more time in large rooms).
5. It is best for operators to work in pairs, with one methodically vacuuming where mosquitoes are likely to be found, while the other facilitates access by moving furniture, clothing and other items.

## Videos

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To watch a video on how to assemble and use the Prokopack aspirator go to:

- PacMOSSI How to collect resting mosquitoes using the Prokopack aspirator – <https://youtu.be/el2G1l2Yt2c>

# Safety/Risk assessment

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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 animal baited tents may include:

- Mosquito transmitted infections
- Battery hazards
- Dogs

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

## References

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Vazquez-Prokopec, G. M. Galvin, W. A. Kelly, R. Kitron, U. (2009) 'A new, cost-effective, battery-powered aspirator for adult mosquito collections.' *Journal of Medical Entomology*.

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