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Moorea eDNA project: Wilderlab eDNA protocol

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We use this protocol and it's working

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Abstract

This procedure is used to collect eDNA samples from different locations around Mo'orea, French Polynesia; completed by UC Berkeley's Island Sustainability class of 2025 with Dr. Chris Meyer. This protocol includes steps to select sites of interest, collect a water sample, and filter and process the sample.

Materials

- Transportation (truck and boat)
- Attire appropriate for constant re-entry into the water and sun exposure.
- Bring a device to track GPS location. Ex. phone at full battery with GAIA GPS app installed.
- Bring clean, latex gloves.
- 1L screw top container (preferred) or gallon Ziploc bags.
- Wilder Lab eDNA kits.

Site Selection

- 1 Only public places where water is easily accessible (either fresh or saltwater). Select sites from a wide geographic range around the island. Select sites from a variety of ecosystems that will predictably yield different DNA signals, i.e. freshwater stream, coral reef near the crest, coral reef near shore, deep water off a dock, beach near hotel, etc.

Protocol

2 Collecting Water Sample

- 2.1 Submerge the container/bag under the water at the chosen site. The container must be fully submerged and rinsed in the body of water to be sampled to avoid contamination from previous sites. After rinsing, submerge the open container under the water, ideally 1 meter below the surface to avoid contamination from residue or pollution on the surface. If water is shallow, take them higher in the water column to avoid sediment input from the bottom. While still holding the container underwater, screw the top on or seal the bag so you capture surface water when you retrieve the container.
- 2.2 Record the GPS coordinates of the selected site on GAIA GPS and name the eDNA kit.

3 Collecting eDNA

- 3.1 With clean, bare hands, select a WilderLab eDNA kit and tear it open along the indicated line at the top of the kit bag.
- 3.2 Open the kit bag and remove the latex gloves. Put on the gloves.
- 3.3 Remove the large syringe and filter from the kit bag and set them on your workspace or in another set of clean, gloved hands. Be careful not to set them down on any potentially contaminated surfaces.
- 3.4 Pick up the large syringe and place the tip of it into your water sample. Pull back the plunger slowly, filling the syringe with the water sample. Stop once the plunger is roughly 2cm from the end of the barrel.
- 3.5 Pick up the filter. Screw it onto the large syringe tip (clear sides screwing together), attaching the two pieces together. Be careful to make sure that the pieces are tightly

screwed together to ensure a water-seal.

- 3.6 Hold the large syringe over an empty container and begin to push the plunger down, forcing water through the filter and into the discard container. If it is too difficult to push the plunger down, you may pull the plunger back slightly before resuming pushing the plunger downwards. This can slightly dislodge the sediment on the filter and make liquid evacuation easier momentarily. Continue this until the syringe has been emptied.
- 3.7 Unscrew the filter from the large, empty syringe and place the filter back onto the clean workspace.
- 3.8 Repeat steps 3.4-3.4-1.7 until 1 L of the water sample has been pushed through the filter.
- 3.9 After all of the water is filtered out and the filter has been removed, reload the large syringe with air by pulling the plunger back, and release the air by pushing the plunger down. Repeat this until no more water is being expelled from the syringe.
- 3.10 Pull the plunger of the large, empty syringe back once more, filling it with air.
- 3.11 Screw the filter onto the large syringe and push the plunger down, forcing the air through the filter, removing any remaining water from the filter.
- 3.12 Unscrew the filter from the syringe.
- 3.13 Take the full 1.5ml syringe out of the kit bag. Remove the black cap from the syringe. Be sure not to push down the plunger until step 3.15.
- 3.14 Screw the full 1.5ml syringe to the clear end of the filter. Screw the black cap from the syringe onto the blue end of the filter. Ensure that each element has been tightly screwed together and is water tight.
- 3.15 Push down the plunger of the 1.5ml syringe, releasing the liquid preservative into the filter. Shake.
- 3.16 Place syringe with filter attached into Wilder DNA kit bag. Label the bag with the sample number and location.
- 4 Mail the labelled bag to Wilderlab NZ Ltd at 129 Park Road, Miramar, Wellington 6022, New Zealand for further processing.



5 Await results.

Protocol references

Wilder Lab: <https://www.wilderlab.co.nz/>

Sampling Instructions: <https://www.wilderlab.co.nz/directions#active>

Acknowledgements

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Guillaume & Jacques