Jul 24, 2024

eDNA Sampling Protocol: Smith-Root citizen scientist sampler

DOI
dx.doi.org/10.17504/protocols.io.q26g71dw9gwz/v1

susannat[1]

[1]SCCWRP

K Kamola Mirjalilova
SCCWRP

OPEN ACCESS

DOI: dx.doi.org/10.17504/protocols.io.q26g71dw9gwz/v1

External link: https://youtu.be/BupozR1fnlg

Protocol Citation: susannat 2024. eDNA Sampling Protocol: Smith-Root citizen scientist sampler. **protocols.io** https://dx.doi.org/10.17504/protocols.io.q26g71dw9gwz/v1

Protocol status: Working
We use this protocol and it's working

Created: July 24, 2024

Last Modified: July 24, 2024

Protocol Integer ID: 104007

Abstract

This protocol outlines the procedures for using the Smith-Root citizen scientist sampler for environmental DNA (eDNA) sampling. It includes a detailed guide on water collection and filtration steps, emphasizing the importance of maintaining sterility to avoid cross-contamination. The protocol specifies the use of Smith-Root 0.45 µm self-preserving filters and provides instructions for their proper handling and storage. Additionally, it includes steps for preparing filter blanks and cleaning the sampler to ensure accurate and reliable eDNA data collection. This method is designed to be accessible for citizen scientists, with clear, step-by-step instructions supported by visual aids and online resources. The protocol ensures that eDNA samples can be collected effectively from various water sources, contributing to ecological and biodiversity research efforts.

Attachments

SmithRoot_Water_eDNA...
270KB

12084.001_eDNA_Citiz...
1.5MB

Image Attribution

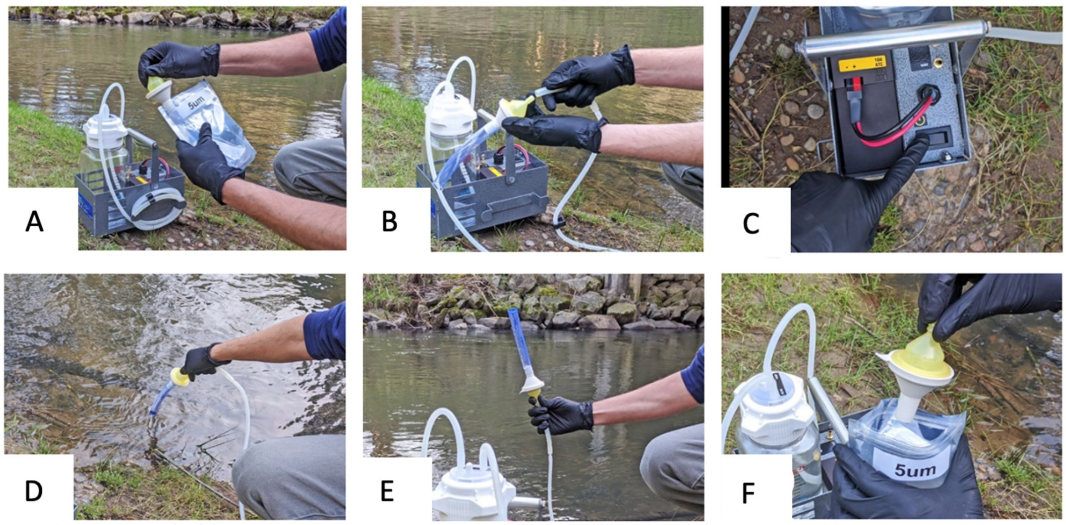

Figure 1. Overview of Smith-Root sampler filtration steps. Images from Smith-Root.

Guidelines

Demonstration Video: https://youtu.be/BupozR1fnlg

Materials

- Smith-Root citizen scientist sampler*
- Smith-Root 0.45 um self-preserving filters
- Nitrile gloves
- MilliQ water for filter blank (~100 ml)

If not sampling directly from a stream or other water source:

- 1 L bottle or large Whirl-Pak bags for water sample collection**
- DNAway or 10% bleach for cleaning bottles

Before start

*Before heading to the field, ensure the sampler is fully charged. There is a charging cord included for the lead acid battery.

** Bottles should be sterilized before use and between sampling sites to prevent cross- contamination. To sterilize, soak in acid wash (1% solution of hydrochloric or nitric acid), rinse three times in DI H2O, and autoclave. Alternatively, soak in bleach solution (final concentration 1-5%) and rinse three times with DI H2O.

Water collection

1 Skip this step if sampling directly from a stream or other water source (as in Figure 1D). Wearing gloves, rinse sample bottle three times with ~10 ml of sample water; discard rinse water offshore or away from sampling site. Fill bottle with 1 L of sample water. If bottles are limited, large Whirl-Pak bags can be used instead.

Filtering

2 Wearing gloves, open an individually wrapped Smith-Root filter pouch.

3 Without touching the snorkel, attach it to the smooth end of the filter housing (**Figure 1A**).

4 Attach the sampler hose to the ridged end of the filter (**Figure 1B**).

5 Turn on the vacuum pump (**Figure 1C**).

6 Insert the snorkel into the sample water (**Figure 1D**).

7 When 2 L has been filtered (or when filter clogs), invert the filter housing so the snorkel is facing the sky. Continue to run the vacuum pump for 20 seconds to air dry the filter (**Figure 1E**). Record final volume in field data sheet.

After filtering

8 Remove the snorkel from the filter housing and discard the snorkel.

9 Place the filter housing back in the pouch (**Figure 1F**)

10 Label pouch with Station, Date, Depth, Replicate, and Volume filtered.

11 Discard the filtrate in the collection vessel.

12 Repeat all steps for as many replicates as requested (default = 3 replicates).

Blanks

13 Filter ~100 ml of MilliQ water through a clean filter as above. Process one blank for each sampling day.

Filter storage

14 Smith-Root self-preserving filters are stable at room temperature for six months.

Cleaning the sampler

15 Thoroughly wipe down the Smith-Root sampler after each field day with a wet paper towel. Note that seawater can corrode the metal parts of the sampler.