Exploring Native Microbiota Lab Manual

BIO398, Winter 2024

Lab 2 : Field Trip to Jimtown Beach

Background:

Field sampling sounds easy until you do it. There are many "tricks of the trade" that you will probably only pick up when you've worked in the field collecting your own samples. The goal of this lab is to transfer some of this knowledge by demonstrations, and also give you a chance to explore and conduct a dry run for your sampling next week. You will also be introduced to the types of "macroscopic" environments that may occur at Jimtown beach and similar coastal marine systems.

Specific Goals for Today's Lab:

- Demonstrate aseptic microbial sampling of water, sediment, plant-associated microbiota, and post-field processing in the lab
- Demonstrate the use of the Moodle check-in / check-out field sampling system that you will use when you do your field sampling
- Demonstrate the characterization of water chemistry with a YSI probe / other similar instruments
- Have an opportunity to explore microbial systems, and practice taking your own samples to inform your sampling plan (though it may be short field trip due to the chilly winds!)

Safety notes:

This lab will have some unique safety issues, given that we are conducting it in the wintertime. It's critical to dress warmly since we will be at the seaside which is often windy and cold. Wear more clothes than you think you will need and layer up! You should also be careful not to get yourself wet, as hypothermia can quickly set in these conditions.

Related to this, I will be requiring that people do their self-directed field sampling next week in groups of 2 or more for safety reasons. You will also be required to provide me with an emergency contact number, the GPS coordinates / address of your sampling site, and use the Moodle forum to check-in and check-out when you leave for sampling and return from sampling, along with selfies and/or pictures of the environment you are sampling from.

Finally, I will be providing you with ice packs that have been stored at -80°C to immediately chill certain samples, as well as regular wet ice for other samples. It is important to note that the former will be extremely cold, and that certain types of plasticware may not be able to withstand sudden freezing and have the potential to crack / explode. Therefore, it is best to only use cryovials when in contact with extreme cold since they are designed to withstand these cold conditions. For liquids or

sediment samples that need to be stored in larger plastic vials for transport back to the lab, it is best to keep them on regular ice. These tubes can go in the -80°C / -20°C freezers afterwards, but make sure to leave some room in the top of the tube to allow for the expansion of ice.

Specific considerations for the long-term use of your samples / datasets:

- Notes should be made in the field or as soon after as possible. If cold or other environmental conditions prevent this, record your observations as soon as possible after sampling. Try to at least give your tubes a placeholder number so they don't get mixed up.
- Pictures and/or videos of sampling are a useful historical record. Try to get a picture with the label in it, if possible.
- Record relevant environmental conditions, even if they are qualitative. This may be critical for someone to interpret your data in the future.

Lab and Departmental Resources, Field Trips:

- We are using departmental vehicles today, but you are expected to use your own vehicle for field sampling. If this poses a challenge for you, please discuss with me and we will find a way to make sampling work for you.

Example packing list:

Sampling tools:

☐ Disposable gloves
☐ Syringes of various sizes
☐ Clean sampling tools, wrapped in tinfoil
☐ Kimwipes or paper towel or Kleenex
☐ 70% ethanol spray bottle
☐ 50mL centrifuge tubes, and a rack
☐ 15mL centrifuge tubes, and a rack
☐ Cryovials with 100µL glycerol, and a cryobox
☐ Labelling tape
☐ Pens, pencils, and permanent markers
☐ Notebook
☐
☐
☐

Larger equipment / other:

☐ Large cooler or box for storing supplies
☐ A tray to use as a clean surface
☐ A small cooler with -80°C ice packs
☐ A small cooler with regular ice
☐ YSI or other probes for water chemistry measurements (and a thermometer)
☐ Secchi disk
☐ Buckets and rope
☐ Meter sticks / rulers
☐ Snacks and a drink
☐
☐
☐
☐

To prepare for return to lab:

☐ Filtration rigs pre-loaded with 0.2 µm filters
☐ Tubes ready to collect 0.2 µm filtrate
☐
☐

Lab 2 Activity:

What tools from today's lab will you need for your sampling? Make a complete list for yourself for next week.

What physicochemical parameters do you need to take during your sampling? What equipment would you need?

Are there any special requirements you need for your sampling? A DIY coring device? Scalpels/razor blades? Something else?