LAC Algae Sampling Guidelines

The guide below outlines how to collect, preserve, and submit phytoplankton or periphyton samples to Larratt Aquatic.

Phytoplankton Sampling:

Phytoplankton – Lake Sampling

Preparation

1. Obtain clean **1 L** bottle(s)
2. Bottles are clearly labelled with:
    - Date and Time
    - Client
    - Project (if applicable)
    - Location
    - ID (if different than location)
    - Preservation (Y or N)
    - Sampled by: _____

Sampling

1. Wear gloves
2. Triple rinse clean 1 L bottle with designated sample water
3. Fill rinsed 1 L bottle with designated sample water
    - Collect by hand for surface or Van-Dorn for water at depth(s)
4. Do not deliberately target large algae clumps
    - Collect secondary samples of dense algae clumps if desired
    - Mark as such, these samples will be processed differently by our lab
5. Immediately place samples in a chilled dark cooler upright
    - If adding preservative (i.e., Lugol's iodine), see photo guide below

Post Sampling

1. **Submit samples to LAC Online Portal:** https://larrattaquatic.shinyapps.io/CoCApp/
2. Ship samples to LAC with adequate icepacks to keep samples cold
    - Sample arrival temperature at LAC should be <10 °C
    - Shipping address:
      #105 - 2081 McDougall Rd.
      West Kelowna, BC, V1Z 4A2

Phytoplankton – Creek/River Sampling

Preparation

1. Obtain clean **1 L** bottle(s)
2. Bottles are clearly labelled with:
    - Date and Time
    - Client
    - Project (if applicable)
    - Location
    - ID (if different than location)
    - Preservation (Y or N)
    - Sampled by: _____

Sampling

1. Wear gloves
2. **Do not disturb algae (periphyton) build up on rocks/sediment**
    - If stepping into the creek/river wait for periphyton disturbance to diminish or sample upstream of disturbance
3. Triple rinse clean 1 L bottle with designated sample water
4. Fill rinsed 1 L bottle with designated sample water
    - 1 bottle/sample for large rivers, plan to collect sub-samples on a cross-river transect, batch in a clean mixing container and fill sample bottle
5. Do not deliberately target large algae clumps
    - Collect secondary samples of dense algae clumps if desired
    - Mark as such, these samples will be processed differently by our lab
6. Immediately place samples in a chilled dark cooler upright
    - If adding preservative (i.e., Lugol's iodine), please see photo guide below

Post Sampling

1. **Submit samples to LAC Online Portal:** https://larrattaquatic.shinyapps.io/CoCApp/
2. Ship samples to LAC with adequate icepacks to keep samples cold
    - Sample arrival temperature at LAC should be <10 °C
    - Shipping address:
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Periphyton Sampling

Sandy Substrates – depositional sites

Preparation

1. Equipment needed:
    - Clean **500 mL** - **1 L** bottle(s) (sample container)
    - Large petri dish or lid
    - Spatula
    - Mixing jar
    - Filtered water / DI
2. Bottles are clearly labelled with:
    - Date and Time
    - Client
    - Project (if applicable)
    - Location
    - ID (if different than location)
    - **Diameter of sample surface**
    - Preservation (Y or N)
    - Sampled by: _____

Sampling

Periphyton are very sensitive to flows and light regimes so choose sample sites with similar velocity, canopy cover and depth if you plant to compare samples from above/below a disturbance or feature.

1. Wear gloves
2. Select 3-5 random subsites (be consistent) within your location and avoid disturbing them
    - Submerge the petri dish lid or other lid into the sand/silt by 1 cm
    - Slide the spatula under the lid to trap the sample material inside
    - Empty the lid into a wide mouth 1 L jar
3. Repeat this process for the next subsamples
4. Fill the 1L jar with 500 mL filtered river water or de-ionized water and shake vigorously for 1 minute to dislodge periphyton from the substrate
    - Allow sand to settle and quickly decant the sample water to the sample container
5. **Record the total substrate surface area sampled** (total surface area covered by lid scraped into sample bottle is required for lab analysis)
6. Immediately place sample(s) in a chilled dark cooler upright

Post Sampling

1. **Submit samples to LAC Online Portal**: https://larrattaquatic.shinyapps.io/CoCApp/
    - Include Surface Area sampled in comments
2. Ship samples to LAC with adequate icepacks to keep samples cold
    - Sample arrival temperature at LAC should be <10 °C
    - Shipping address:
      #105 - 2081 McDougall Rd.
      West Kelowna, BC, V1Z 4A2

Periphyton Sampling

Stoney substrates – erosional sites

Preparation

1. Obtain clean **500 mL** - **1 L** bottle(s)
2. Obtain sampling ring/surface area indicator
3. Bottles are clearly labelled with:
    - Date and Time
    - Client
    - Project (if applicable)
    - Location
    - ID (if different than location)
    - **Diameter of sample surface**
    - Preservation (Y or N)
    - Sampled by: _____

Sampling

Periphyton are very sensitive to flows and light regimes so choose sample sites with similar velocity, canopy cover and depth if you plant to compare samples from above/below a disturbance or feature.

1. If multiple samples are being collected:
    - Note substrate size
    - Try to sample from areas with similar size stones/cobbles with 10-50 cm/sec flows
2. Wear gloves
3. Select 3-5 random stones/cobbles of similar size per submitted sample (be consistent)
    - The upper surface of the stone should accommodate your sampling ring
4. Place stones in a tray with river water out of direct sunlight
5. Use a sampling ring to define an area on the top of each stone, and scrape all periphyton loose within this area
6. Use squirt bottle of filtered river water or de-ionized water to rinse loosened periphyton into clean sampling bottle
    - Use approximately 100 mL of rinse water/stone
    - Remove large detritus, leaves, moss etc. if chl-a analysis is desired
7. Repeat for all 5 stones, rinsing loosened periphyton into one sample bottle
8. **Record the total surface area sampled** (total surface area scraped into sample bottle is required for lab analysis)
9. Immediately place sample(s) in a chilled dark cooler upright

Post Sampling

1. **Submit samples to LAC Online Portal**: https://larrattaquatic.shinyapps.io/CoCApp/
    a. Include Surface Area sampled in comments
2. Ship samples to LAC with adequate icepacks to keep samples cold
    a. Sample arrival temperature at LAC should be <10 °C
    b. Shipping address:
    #105 - 2081 McDougall Rd.
    West Kelowna, BC, V1Z 4A2

Preserving a Sample with Lugol's Iodine

Lugol's iodine can be used to extend sample shelf-life.

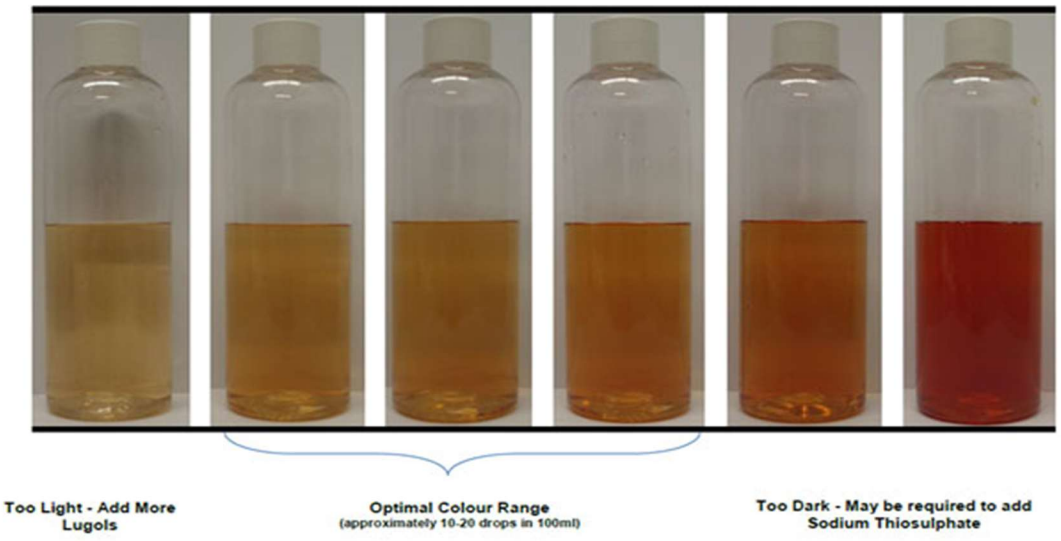
The downside of this process is cell features with starch darken making identification difficult. **Applying too much Lugol's iodine can make cell ID impossible in some cases**. The image below shows optimal colour ranges for preservative with Lugol's Iodine. Whenever possible, please keep preserved samples refrigerated.

Preparation

1. Set up near a consistent light source, such as a window
2. Obtain a pipette or eye-dropper
3. Obtain preservative (Lugol's iodine for phytoplankton samples)
4. Set up samples to be preserved

Preservation

1. Wear gloves
2. Shake sample
3. Use a pipette or eye-dropper to administer ~2 mL of Lugol's iodine to the sample
4. Shake sample thoroughly
5. When Lugol's is evenly distributed in sample, hold it up to a light or window
6. Check sample colour against guide below
    - If sample is too light, repeat process from step 3
7. When the colour matches the guide below, **do not add more Lugol's**
    - A typical 1L sample will require 2-10 mL of Lugol's iodine, but the amount depends on the biomass in the sample. For this reason, dosage should be based on sample colour after dosing, rather than using a fixed volume of Lugol's.



When complete, the sample should appear yellowy/orange, similar to weak tea or iced tea.