2023 Characterization of Sediment and Water Samples from Clayoquot Sound, Vancouver Island, British Columbia, Canada

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INTRODUCTION

Microplastics (>5mm) are polymers found in bed sediment and bodies of water, potentially causing damage to organisms and ecosystems. *Alexandrium catenella* is a toxic marine dinoflagellate capable of producing saxitoxins, a neurotoxin that bioaccumulates in organisms and may cause paralytic shellfish poisoning in mammals that consume them. The purpose of this study is to produce data that will serve as a baseline for tracking changes in the Clayoquot Sound region over time.

Figure 1: Clayoquot Sound sampling region (black square) in comparison to University of Washington Tacoma location (black dot).

METHODS

Collection: 2023 Sediment and Water samples were collected at 9 stations around Clayoquot Sound.

Cyst:

- Cysts prepared through sonicating, etching, and staining .
- *A. cantella* identified using an epifluorescent microscope .

Microplastics:

- Plastics isolated through sieving, density separation, and oxidation.
- Microplastics were counted and characterized in 0.33µm sieves.

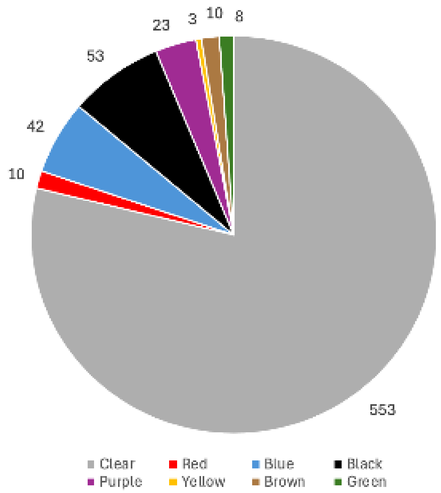

Figure 2: Number of microplastics by color recorded.

RESULTS

Microplastics:

- 702 microplastics counted in both sediment and water samples.
- 79% of plastics found were clear.
- All microplastics found were fibers.
- Average length = 2.00 mm.
- The highest number of plastics were found at Steamer Cove.

Cyst:

- Average cyst counts over all stations was 16 cysts, 80 cyst/cc (wet), and 194 cyst/cc (dry).
- Highest cyst count came from Herbert Head (38) with a total of 28 cysts, 140 cyst/cc (wet), and 273 cyst/cc (dry).
- Lowest cyst count came from Bawpen Bay with a total of 4 cysts, 20 cyst/cc (wet), and 38 cyst/cc (dry).
- Graphs made comparing cyst/cc (wet/dry) to median grain size, total organic carbon, and depth in meters showed no correlation.

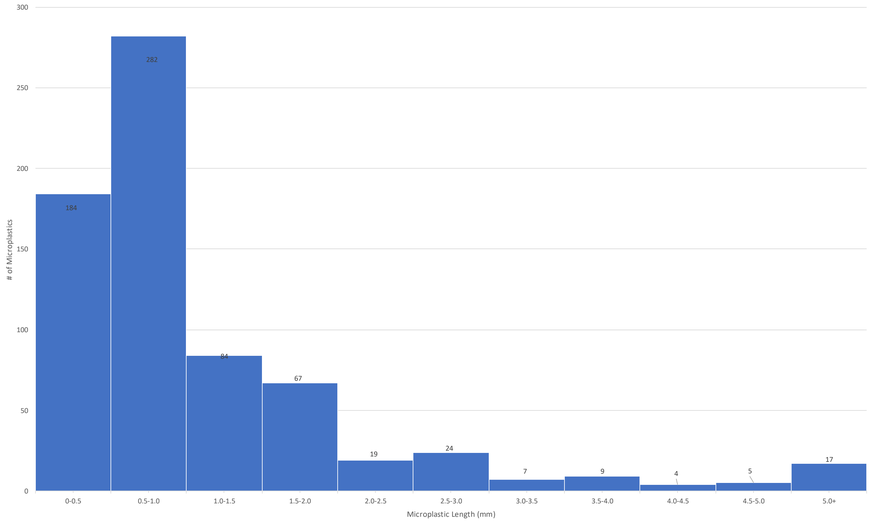

Figure 3:Relative length in mm of microplastics.

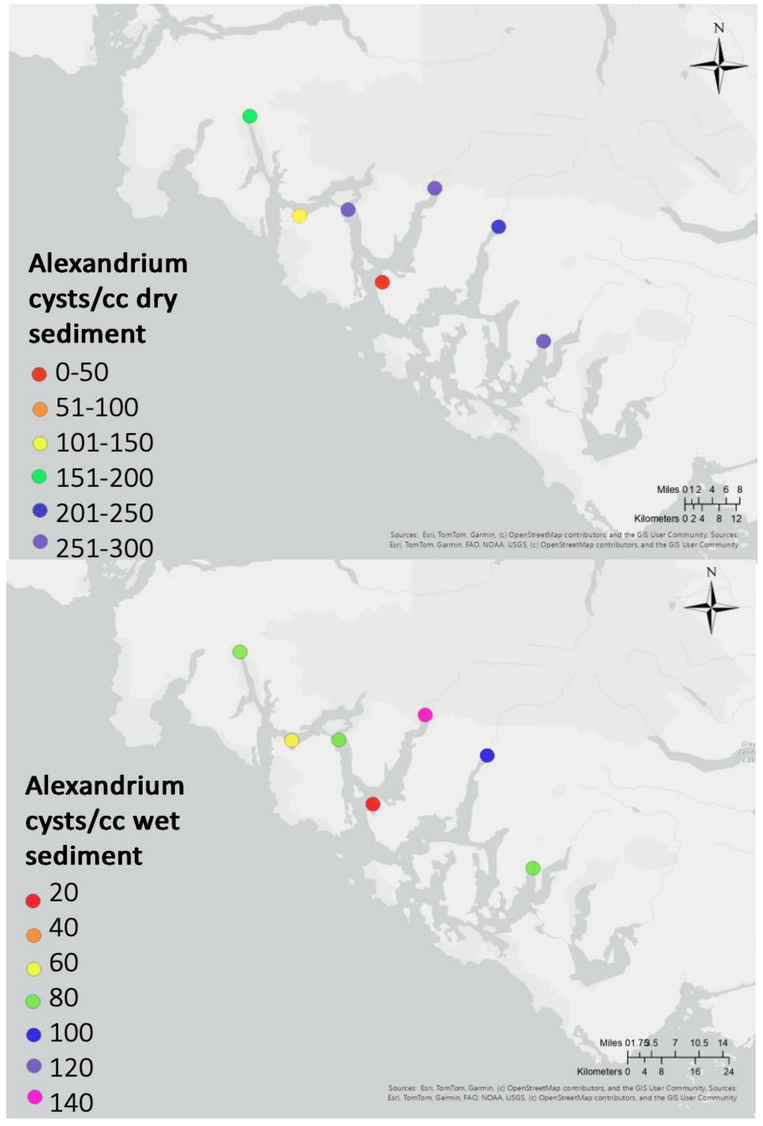

Figure 4: [Top] Cyst/cc (dry) map of 7 stations sampled. Cyst/cc (dry) represents distribution of cysts in dry sediments without water fraction. [Bottom] Cyst/cc (wet) map of 7 stations sampled. Cyst/cc (wet) represents distribution of cysts in wet sediments.

FUTURE WORK

Future research in the Clayoquot Sound region will include sampling these stations for further comparative analysis of microplastics and *A. catenella* over time.

REFERENCES

Sources available with QR code:

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