

Urbanization's Effect on Algae Growth in NYC

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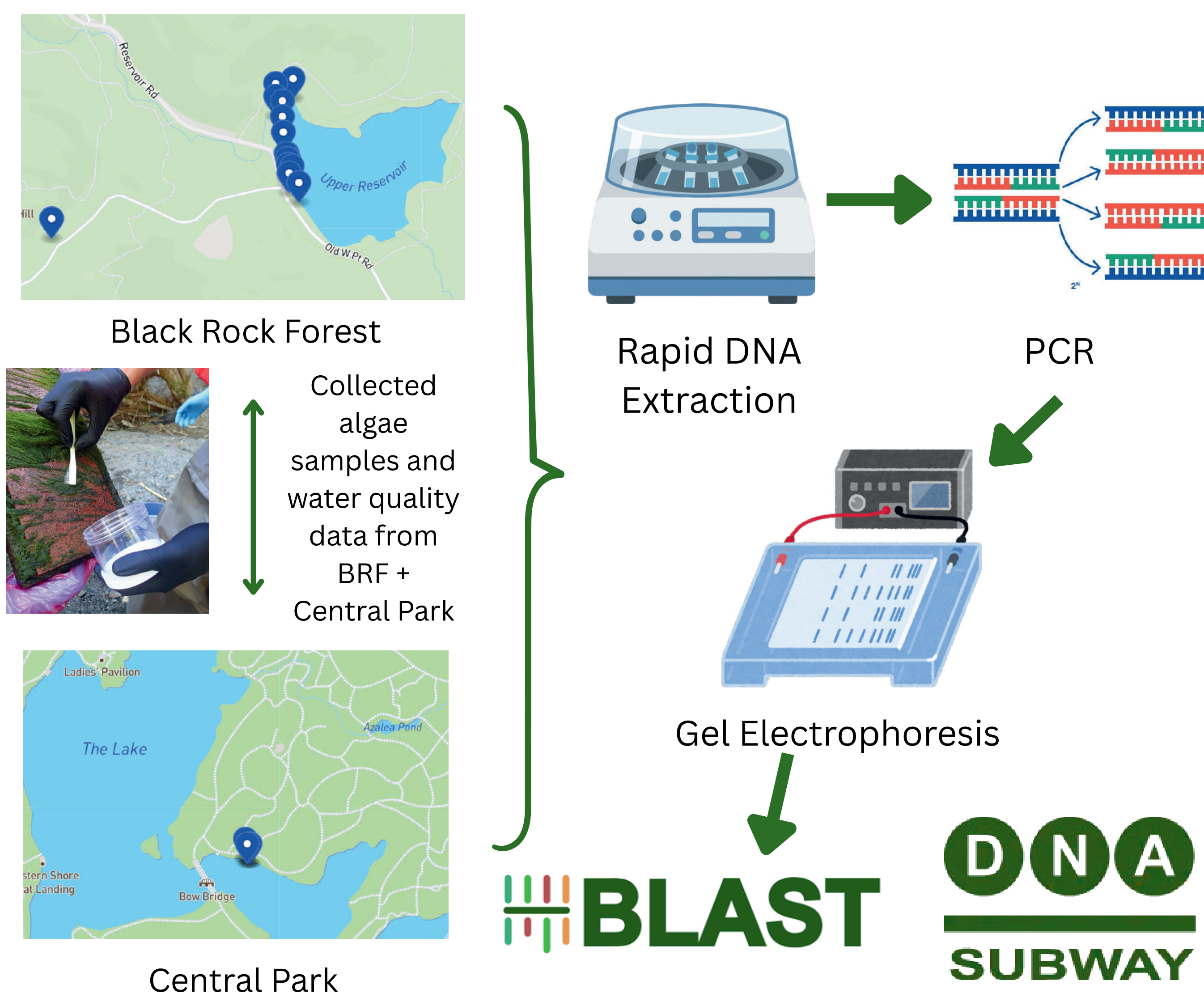
Background

- Urban runoff carries pollutants into nearby water systems
- Algae respond quickly to changes in water and pH, serving as useful indicators of environmental health
- This study compares algae biodiversity between Black Rock Forest and a more urban-impacted site in New York to understand how runoff affects local ecosystems

Questions

- How does urban runoff affect algae biodiversity?
- Are there differences in algae species between BRF and Central Park?

Methods



Results

- Water quality tests were successfully completed, showing differences in pH and nutrient levels between sites
- Algae were abundant in Black Rock Forest but rare or absent at Central Park
- After two PCR trials, only one sample successfully sequenced, from Central Park, which is the moss *Hygroamblystegium tenax*.

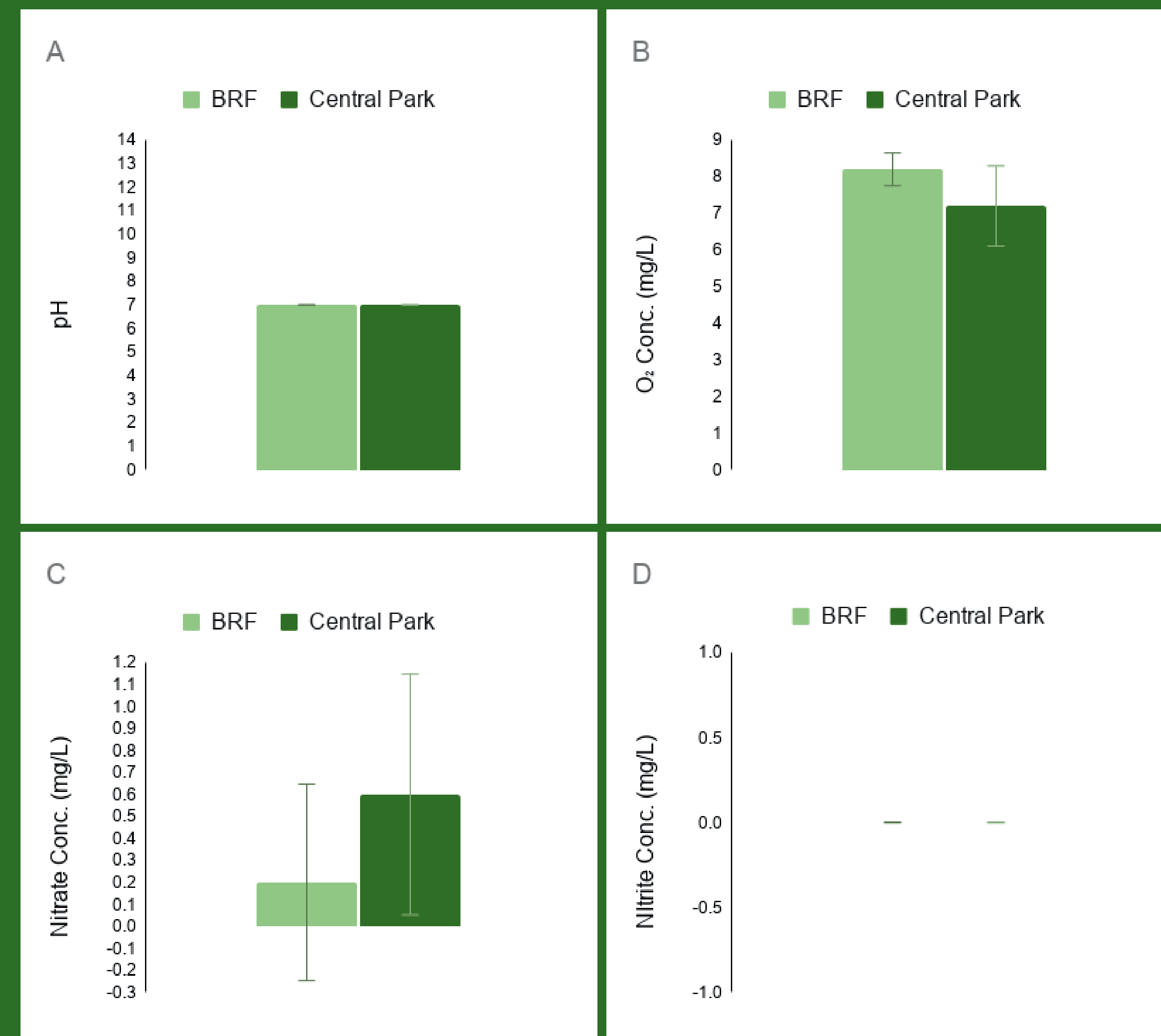
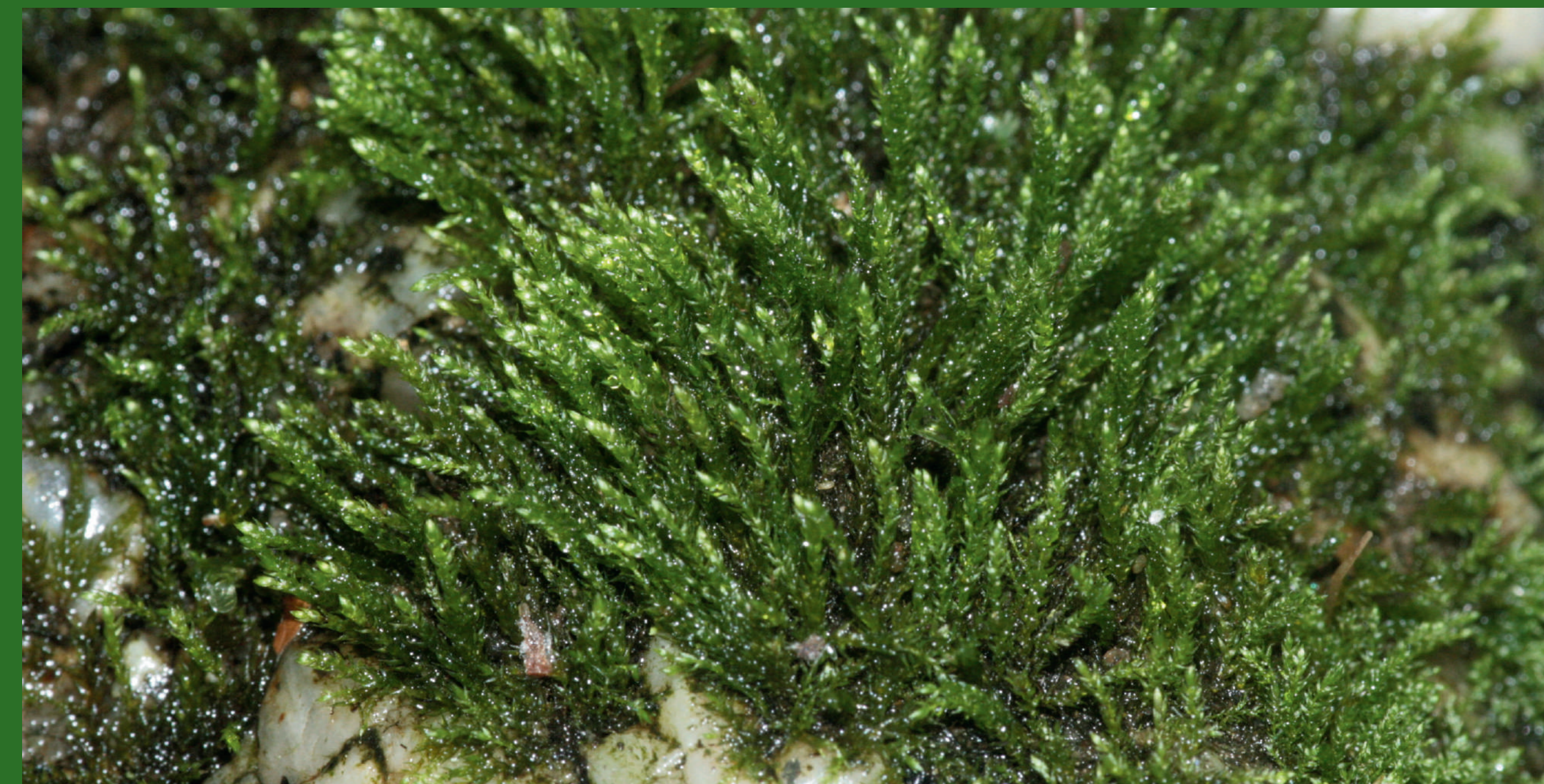


Figure 1: Four graphs comparing water quality results in BRF and Central Park
 a) PH \pm 1 SD
 b) Dissolved Oxygen \pm 1 SD
 c) Dissolved Nitrate \pm 1 SD
 d) Dissolved Nitrite \pm 1 SD

Discussion

- During collection, algae were common in Black Rock Forest but mostly absent in Central Park: urban runoff may limit algae in city areas, favoring hardy bryophytes over more sensitive algae species.
- The successfully barcoded urban sample was moss. DNA barcoding confirmed this, but PCR did not work well on algae. Possible reasons include contamination, dirt, or incorrect primers.
- Possible improvements:
 - More specific algae primers
 - Improved sample cleaning to reduce contamination
 - Increased number of samples or different urban sites



Figure 2: Upper Reservoir at BRF

Future Research

- Given the appearance of mosses in our barcoding, further research could be conducted to assess the differences in lakeside aquatic or lakeside moss species between urban and non-urban sites

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