The Effect of water flow on the Bacterial Diversity in Prince Edward County

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Background

- A recent study has shown there to be a higher bacterial abundance in low flow areas, such as ponds or slow moving creeks, versus the higher flowing rivers (Wiegner et al. 2012).
- According to a study conducted in China, there was a steady correlation between high diversity of bacteria found in freshwater rather than in brackish or saltwater (Wang et al. 2013), and since these are all freshwater sites, there may be a high bacterial diversity.
- This study was conducted in the middle of February, a rather cold month, it may be predicted that the results will be low due to decreased bacterial productivity and/or mortality (Adams et al. 2010, Servais et al. 1985).

Specific Aim

- **Research Question:** To compare the diversity of bacteria types found at Buffalo Creek, the Appomattox River, and the Lancer Park pond.
- **Hypothesis:** If there is a higher water flow, then there will be a lower bacterial diversity found and a higher bacterial diversity in the stationary pond.

Methods

- **Site Description and Sampling Collection**
- **Bacterial Culturing and Serial Dilution**
- **Genomic DNA Extraction**
- **Polymerase Chain Reaction (16 rRNA)**
- **Purification Digestion**
- **Gel Electrophoresis**
- **Submitting Sample for Sequencing**
- **BLAST (Basic Local Alignment Search Tool)**

Results

- **Research Question:** To compare the diversity of bacteria types found at Buffalo Creek, the Appomattox River, and the Lancer Park pond.
- **Hypothesis:** If there is a higher water flow, then there will be a lower bacterial diversity found and a higher bacterial diversity in the stationary pond.

Conclusions

- There is no definite data correlating water flow to affect the diversity and abundance of bacteria in Prince Edward County.
- The Buffalo Creek sample was identified as genus: *Pseudomonas* and speculated species: *putida*.
- The Appomattox River sample could not be identified: **Bad sequencing results.**
- The Lancer Park Pond sample could not be identified: **Bad PCR results.**

Future Directions

- **Conduct at another time**
  - Summer
  - If temperature has any effect.
- **Locations**
  - Were they too close?
  - New locations further away but in Prince Edward County.
- **Identification help**
  - Fluorescence
  - Strain

References