The Excessive Growth of *Didymosphenia geminata*

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Presentation Outline

- Introduction
- Background on Sampling Sites
- Purpose for research
- Hypothesis
- Methods
- Results
- Conclusions
- Acknowledgments
### Introduction

- Once considered a rare and desirable algae
- Cool, oligotrophic waters
- Adaptable to new environments
- Travels easily

### Introduction

- Strange, bottle-shaped diatom
- Each cell can grow up to 100 µm long and 35 µm wide
- Attach to substrate by stalks
- Forms thick, dense mats
- Poses problems for fisheries, water supply, and recreation
Purpose of Research

- Few studies conducted on optimal habitat
- Currently no strong links to water chemical factors
- Prevent spreading
- Stop growth

Background on Sampling Sites: South Boulder Creek

- Growth monitored 2 and 15 km from Gross Res.
- Used for irrigation and minimal recreational activity
- Little vehicle and human traffic
- Runs through Eldorado Springs
Background on Sampling Sites: Boulder Creek

- Didymo growth monitored 2, 5, 15 km from Barker Res.
- Sampling sites chosen of similar depth, light, & flow conditions
- Supplies 40% of Boulder’s drinking water
- High vehicular traffic
- Heavy sanding/salting in winter

Hypothesis

- *Didymo* will grow abundantly below dam
- Boulder Creek will have higher suspended solids
Methods: Preliminary Study

- During high flows
- Conductivity, pH, temperature, DO
- Flow Rates
- Nutrients
  - Hach meter
- DOC
- Total Suspend Solids from stream surface and streambed
- Didymo rating system

Methods: Summer Study

- Focus on quantifying *Didymo* growth
- Three attempts at collection
- Microscope action
- Same water quality measurements
- TSS & Flow rate
Methods: Lab Work

- Total Suspended Solids
  - Vacuum filtration
- Phytoplankton Identification: *Didymo*
  - 5-50 mL aliquots
  - Gravity settling chambers for 30 hrs
  - 40X magnification
  - At least 100 fields

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\text{Individuals/meter}^3 \Rightarrow \frac{\text{#cells}_{\text{counted}} \times 42^2 \times \text{volume}_{\text{settled}}}{\text{#fields}_{\text{counted}} \times \text{area}_{\text{scraped}}} \]

Flow rate and *Didymo* growth

![Graph showing flow rate and *Didymo* growth over time for Boulder Creek Site 1.](attachment:image.png)
Average Total Suspended Solids

Didymo growth and TSS
Didymo growth

Didymo growth continued…
Nutrient Levels

Conclusions

- As stream flow decreased, *Didymo* increased
- Can resist gradual changes in stream flow
- TSS directly impacts *Didymo*
- Same sediment in both streams
- Information helpful to stream managers

- Visual rating system useful
- Microscope count validation
- Mylar-strip and tile method not adequate for high flows
- Scraping rocks provides no info about growth rate
- Stepping stone to further research
Thanks to all these folks……

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Questions?