Eelgrass diatom project

A collaborative research effort between the Parfrey Lab and IMERSS

Research objectives meeting

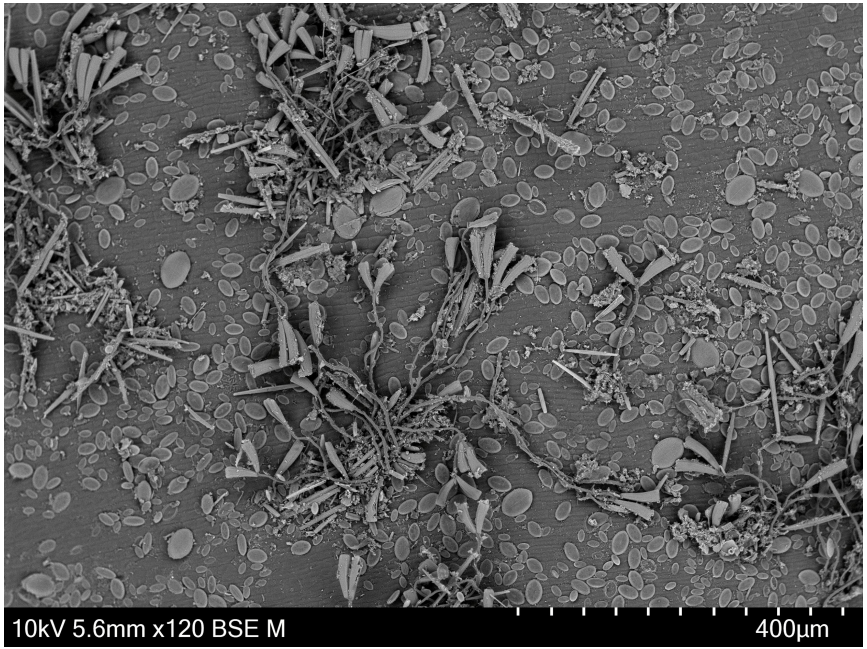
21 October 2020

Background and motivation for project

- Microbial communities (bacteria and protists) on eelgrass leaves are distinct from the water column (Crump et al. 2018; Segovia et al. *accepted*)
- Bacterial communities vary spatially; different meadows host different communities (Bengtsson et al. 2017; Fahimipour et al. 2017)
- Bacterial community composition varies based on leaf age (Segovia et al. *in prep*)
- Eelgrass hosts a core microbiome; some taxa are always present on eelgrass leaves even after a disturbance (Adamczyk et al. *in prep*)
- Diatom communities vary throughout eelgrass leaf; different sections host different communities (Webber and van Asselt preliminary results)

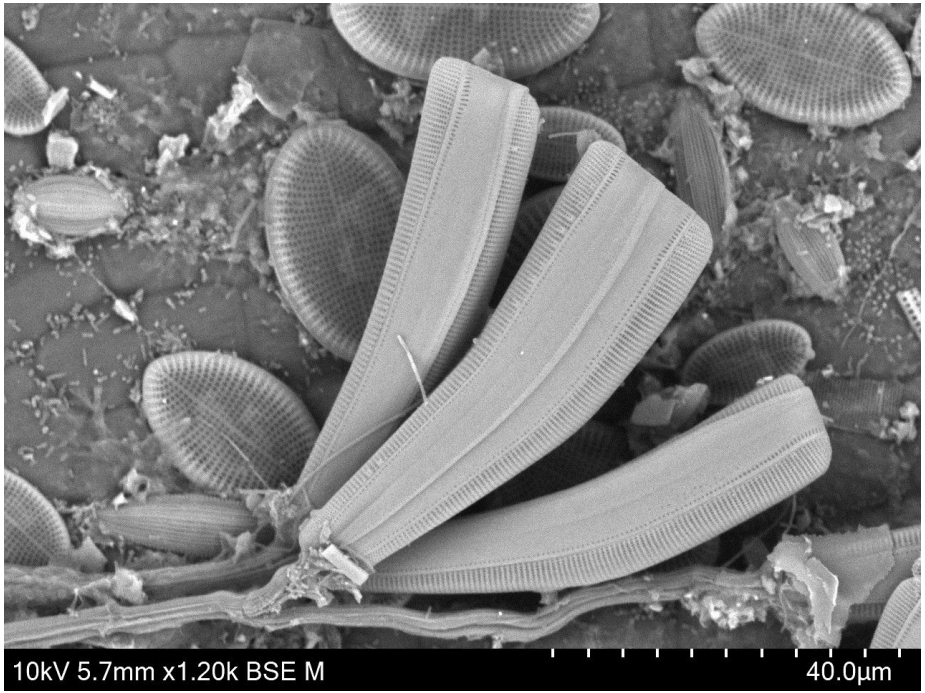
Project goals

- Determine if eelgrass leaves host different taxa on different sections of the leaf
- Understand bacteria X diatom interactions
    - Members and community structure



Overarching question

Are there consistent interactions between specific bacteria and diatom taxa on certain sections of eelgrass leaves?



Sub-questions

1a) What is the spatial structure of the eelgrass leaf epiphyte community?

- Across the same leaf section (tip vs tip)
- Across different leaf section (tip vs middle vs base)

1b) Where are these groups found on eelgrass leaves?

- Diatoms
- Bacteria
- Fungi?

2) Is the eelgrass diatom community distinct from the water column diatom community?

3) Is the epiphyte community different on the edge vs the middle of the meadow?

Proposed general methods and workflow

November sampling -> method validation and data preliminary analysis

Project timeline

Sequencing budget

Sample type	**Number of samples needed**	**Sequencing cost per sample**	**Total cost for sample type**
Eelgrass bacteria	30 (3 sections from 10 different leaves)	~$35	~$1050
Eelgrass diatoms	30 (3 sections from 10 different leaves)	~$35	~$1050
Water column bacteria	6 (3 within meadow, 3 outside meadow)	~$35	~$210
Water column diatoms	6 (3 within meadow, 3 outside meadow)	~$35	~$210
		TOTAL	**~$2520**

SEM and total budget

Sample type	Number of samples needed	SEM cost per sample	Total cost per sample type
Eelgrass	30 (3 sections from 10 different leaves)	$28	$840
Eelgrass (prelim sampling)	3?	$28	$84

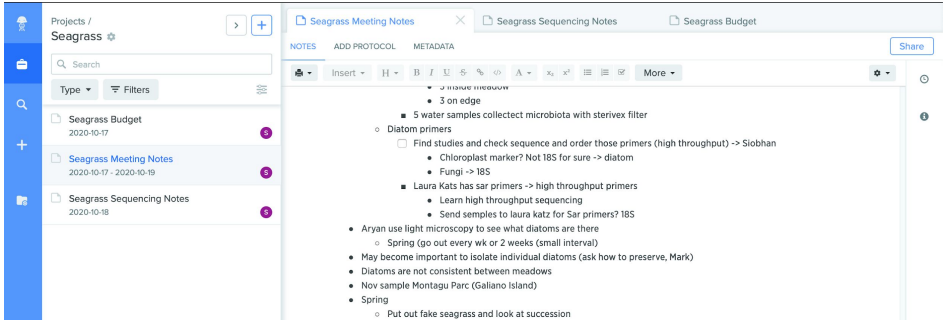
Sequencing	~$2520
SEM	~$840
TOTAL	**~$3360**

Roles

- Siobhan Schenk (UBC) - project lead
- Emily Adamczyk (UBC/IMERSS) - project manager/advisor
- Elaine Humphrey (UVic/IMERSS) - SEM
- Arjan van Asselt (IMERSS) - microscopy
- Mark Webber (IMERSS) - microscopy
- Laura Parfrey (UBC) - project advisor
- Laura Katz? (Smith College) - collaborator

Standards for data and collaboration

- Benchling e-notebook



- Communication
  - 1 work week to answer emails*
  - Ask for help when needed
- Data sharing and storage
  - Check in before giving anyone access to raw data/records
  - Maintain records according to UBC guidelines *(uVic for Elaine)