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Spatial and temporal variation in the biofilm communities on two cultivated kelp species

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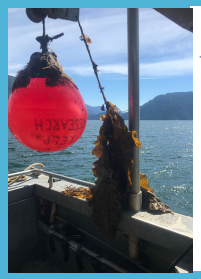
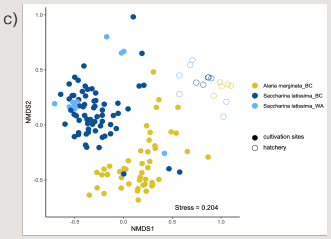


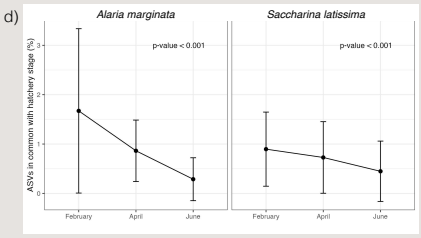
Background

Kelp are colonized by diverse microbes which can positively or negatively influence the growth and health their hosts. Consequently, the kelp microbiome could support kelp cultivation and habitat restoration efforts by improving yields, increasing stress tolerance, or promoting disease resistance. There are still fundamental questions about the cultivated kelp microbiome that need to be addressed before such microbiome-based approaches can be employed. Here we fill a critical knowledge gap regarding how the cultivated kelp microbiome develops as hosts grow and how different abiotic conditions and microbial source pools affect the kelp microbiome.

Results



c) The hatchery microbiome is distinct from the outplanted kelp microbiome.

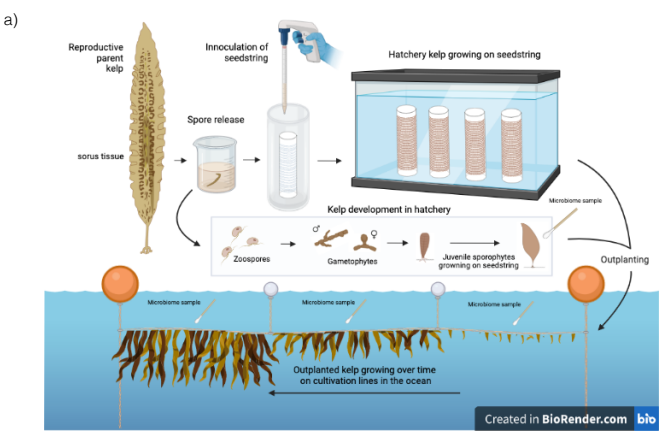


d) A limited subset of bacteria from the hatchery persist over time on outplanted kelp.

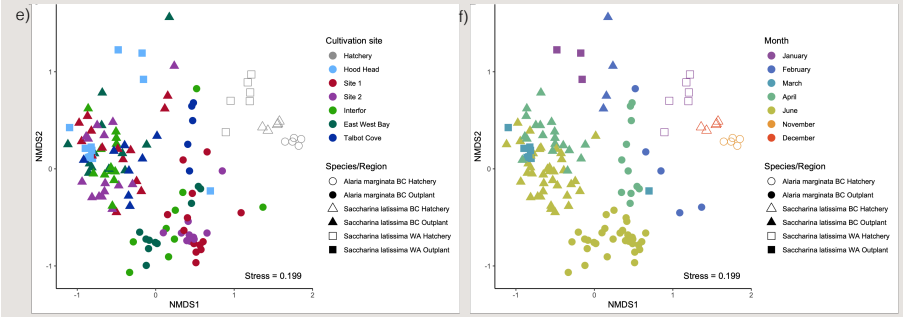
Conclusions

- Consistent microbiome turnover is likely driven by seasonal changes in host or abiotic factors.
- Provides baseline microbiome data for two economically and ecologically important Salish Sea kelp species.
- Preliminary evidence for hatchery stage as target for kelp microbiome manipulation.

Approach



a) Overview of kelp cultivation and microbiome sampling points b) map of hatchery, collection, and cultivation sites. CKR = Canadian Kelp Resources; MRS = Manchester Research Station (NOAA).



e) Cultivated kelp microbiome is structured by host species and geographic location.
f) Monthly community succession is a common feature of the cultivated kelp microbiome.

Acknowledgements

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