BORROWED IMMUNITY – Can lumpfish receive *planctomycetes* from kelp?

By: Lotte Svengård Dahlmo Supervisor: Stefan Thiele

Acknowledgement: Lise Øvreås, Hilde Rief Armo, Karin Pittman, David John Rees & Kenneth Meland

BACKGROUND

- Lumpfish (*Cyclopterus lumpus*) eat salmon lice (*Lepeophtheirus salmonis*) and are used as cleaner fish – however, the mortality rate is high
- Lumpfish spend their first year attached to surfaces like kelp (*Laminaria hyperborea*)
- Biofilm of kelp is rich on the bacterial class *Planctomycetes*
- *Planctomycetes* have shown anticancer and antibacterial activity
- **'Borrowed immunity'** – can lumpfish receive *Planctomycetes* from kelp?

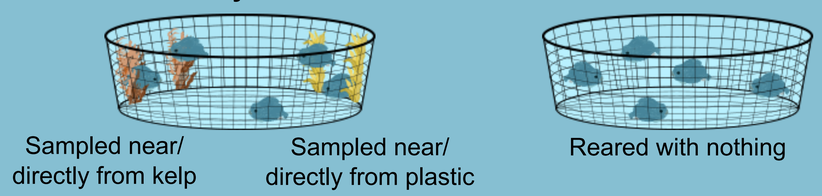
HYPOTHESIS

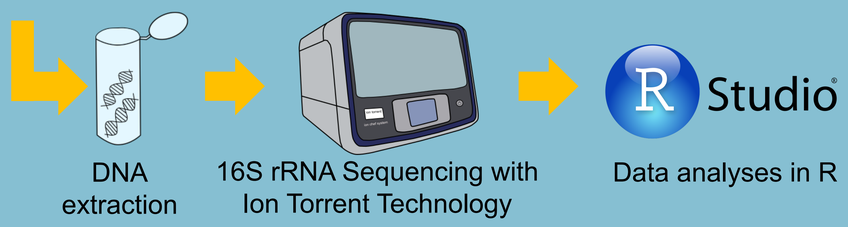
The abundance of *Planctomycetes* would differ between fish treatments

METHODS

Land-based facility:

Sea-based facility:





CONCLUSION

- Showed no difference in the abundance of *Planctomycetes* – low or not at all present
- No difference in microbiome within the facilities, but between the facilities
- Sea-based facility showed a high abundance of the pathogen *Tenacibaculum maritimum* – potentially contributing to high mortality?

RESULTS

- Relative abundance of 0 or <1% of *Planctomycetes* in all fish treatments in both facilities → **no difference**
- Highest relative abundance of *Planctomycetes* in kelp in land-based facility (mean 10.3% ± 6.1%) and in plastic in sea-based facility (mean 9.7% ± 8.60%)
- No considerable difference in microbiome between treatments within the facilities, but between facilities
- High mean relative abundance of the pathogen *Tenacibaculum maritimum* (mean 33-37% ± 9-23%, class: *Bacteroidia*) in fish treatments from sea-based facility

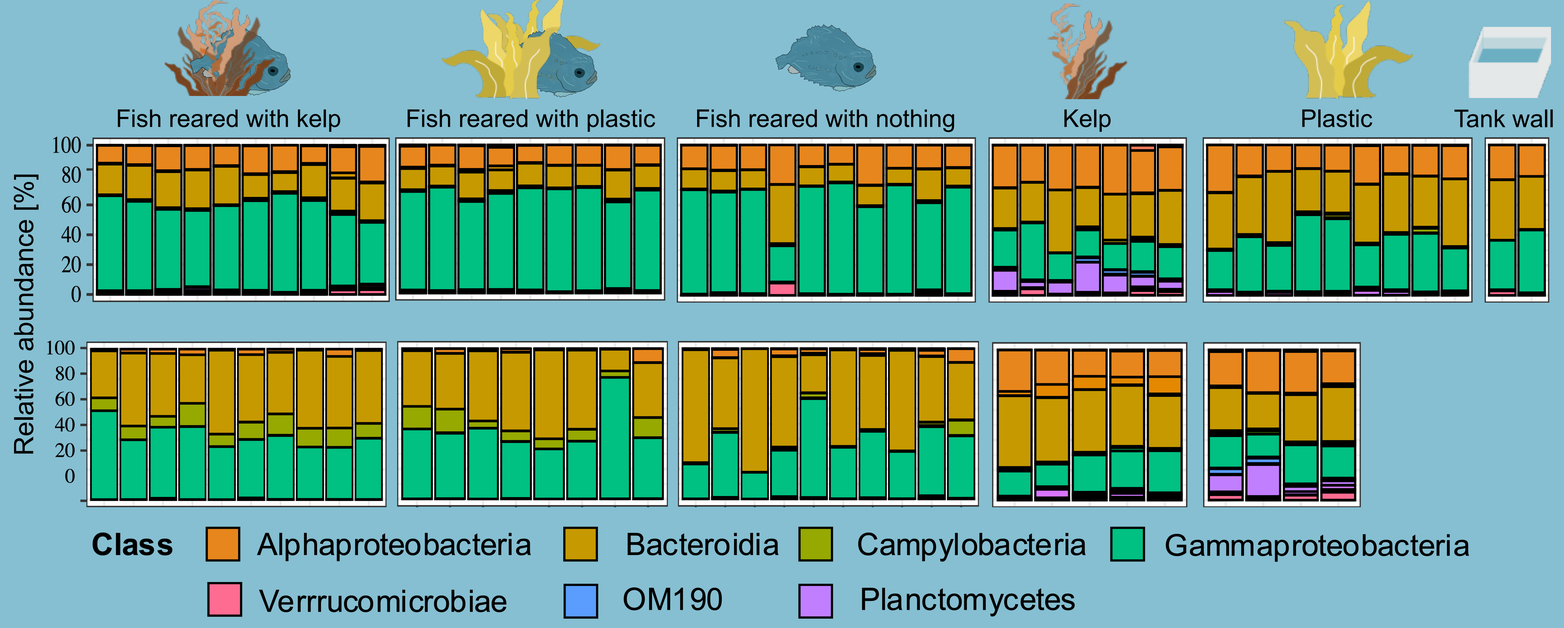


Figure 1. Microbial composition of samples from land-based facility (top) and sea-based facility (bottom), sorted by treatment. The color-coded phylogenetic classification is on class level. 'Tank wall' is samples of biofilm from tank wall with neither kelp nor plastic.

SCAN ME

References:

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Bengtsson, M., Sjøtun, K., & Øvreås, L. (2010). Seasonal dynamics of bacterial biofilms on the kelp Laminaria hyperborea. *Aquatic Microbial Ecology, 60*(1), 71-83. doi:10.3354/ame01409