Priority Effects: The Importance of the First Settler on the Marine Fouling Community

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What is a marine fouling community?

• Assemblages of marine organisms growing attached to an artificial substrata.
• The term “fouling” is used to separate them from the assemblages growing on natural substrata.
• Mostly dominated by invasive species
• Dominant species groups are: Tunicates, Bryozoans, Barnacles, Mussels and Marine Plants.

Why it is important to understand the fouling community?

• The establishment of fouling assemblages often cause harmful economic impacts.
• Artificial substrata are ‘novel’ habitats for fouling organisms.

Methods:

Is there a difference in the biological structure of the fouling community depending on which of these species: B. violaceus, D. listerianum, D. occidentalis, or W. subtorquata, settle first?

- To determine whether or not these species have a priority effect on the fouling community, we deployed 16 experimental plates at the docks of Spud Point Marina.
- The treatments consisted of the four species of fouling organisms.
- Four plates were used for each treatment.
- The plates were attached to racks
- The racks were suspended horizontally 1 m below the water surface
- The plates were brought to the laboratory weekly to collect the data.
- We were careful to avoid disturbing the organisms on the plates.
- All sessile organisms of the fouling community that settled on the plates were considered except for sponges.

Results:

- Species richness is not significantly different between communities with different initial colonizers ($P = 0.798$).
- However, the species Distaplia occidentalis results in a higher number of species.
- Abundance of subsequent settlers did not differ with different initial colonizers ($P = 0.655$).
- D. listerianum and D. occidentalis resulted in almost similar abundances.
- Observational data showed a trend in which D. occidentalis settled at high densities on the plates of D. listerianum, and D. listerianum settled in between or near individuals of D. occidentalis on the D. occidentalis plates.
- Different colonizers showed an effect on the diversity of the communities ($P = 0.055$).
- The species D. occidentalis increased biodiversity in the fouling community of Spud Point Marina.

Conclusion and Further Research Questions:

- The fouling community structure differs due to the colonizer.
- The native species D. occidentalis plays an important role in the fouling community of Spud Point Marina.
- Are the increases associated with D. occidentalis related to its morphology?
- Is there a positive correlation between D. occidentalis and D. listerianum or other invasive species?
- Is D. occidentalis a keystone species in the fouling community at Spud Point?

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