Large *Littorina littorea* Are Common in the Lower Intertidal Due To Size Dependent Food Preference and Are Capable of Surviving in Artificially Transplanted Populations Closer To Shore

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*Littorina littorea* inhabit coastal intertidal environments and are the primary grazers of macroalgae in marine ecosystems. In the Bay of Fundy around Kent Island, New Brunswick, these snails grow exceptionally large, especially in lower intertidal habitats, where they are harvested for human consumption. My project this summer focused on why the snails in the Bay of Fundy get so big and why they are found almost exclusively in the lower intertidal whereas the smaller snails of the same species are abundant closer to the shore.

The first experiment that I ran sought to determine the strength of potential selective forces pressuring larger snails to remain lower in the intertidal by looking at mortality in large snail populations transplanted higher up the tide. Before conducting this experiment, preliminary observations also confirmed that larger snails were not only more abundant in the lower intertidal but also far more abundant in tide pool habitats. This experiment was conducted by placing large snails into escape-proof bins that were placed lower and higher up in the tide. Also, half of the artificial populations that I set up were placed in leak-proof bins to emulate tide pool conditions and the others were contained in bins that would allow water to leak out. The experiment sought to determine whether selective forces were preventing larger snails from being recruited higher up the shore and away from tide pools, and found that the larger snails did not have a dramatically different survival rate when placed outside of their naturally preferred habitat. This suggests that larger snails are not being strongly selected against, but rather that they are leaving the higher intertidal for better resources as they get larger and more capable of avoiding certain predators.

The second major experiment I ran this summer looked to determine how specific preferences of large and small snails affect their choice of habitat. In this experiment I observed macroalgal food preference of *Littorina* among seven different algal species. After 840 trials of 21 paired algae combinations, I found that large and small snails do have distinctly separate preferences in food. This suggests that although it does appear that the larger snails are capable of surviving higher in the tide, these snails may choose to restrict themselves to the lower intertidal based on availability of particular dietary resources.

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