

Range of Tolerance in Mussels

Name: _____

Explore the simulation of the “Evolution of the Aminopeptidase Enzyme in Mussels” and answer the following questions.

Simulation at: <https://sites.google.com/site/biologydarkow/evolution/natural-selection-in-mussels>

1. What is a “Range of Tolerance” for a population?

LAP-94 Population

2. What environmental condition can be manipulated in the simulation that will affect the population size of the homozygous LAP-94 mussels? The “Genotypes” tab on the graph displays the population size of the homozygous LAP-94 mussels.

3. How would a high salinity cause environmental stress in mussels? _____

4. How would a low salinity cause environmental stress in mussels? _____

5. **Collect data** on the “Range of Tolerance” for the homozygous LAP-94 mussels in a table. Record the population size of the homozygous LAP-94 mussels at time 50 to determine the population sizes under different amounts of physiological stress. Be sure to collect many increments of the environmental conditions to determine the zones of intolerance, zones of physiological stress, and the zone of optimal range. Keep the given initial population sizes, mutation rate, and migration rate constant.

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- This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper has a slight shadow on the right side, suggesting it's resting on a surface. There is no handwriting or other markings on the paper.

Range of Tolerance for the Total Mussel Population

8. The "Phenotypes" tab will display the results for the population sizes of the dominant and recessive aminopeptidase phenotypes for the mussels. How can you determine the total mussel population size at time 50 from this data? _____

9. **Collect data** on the "Range of Tolerance" for all of the mussels in a table. Record the population size of the total population size of the mussels at time 50 to determine the population sizes under different amounts of physiological stress. Be sure to collect many increments of the environmental conditions to determine the zones of intolerance, zones of physiological stress, and the zone of optimal range.
10. Graph the range of tolerance curve for the total population size of the mussels. Be sure to include the zones of intolerance, zones of physiological stress, and the zone of optimal range.

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Sample Sites



[Map](#)