Nature's Water Filters: The Impact of Temperature on the Filtration Efficiency of Mussels

Karakousis, Maria (School: Julia Reynolds Masterman Laboratory and Demonstration School)

Background: Mussels are increasingly being utilized as a natural method to remove and filter harmful algae and other natural debris from our water systems. In the context of concerns for climate change, little is known regarding the effect of temperature fluctuations on mussels' filtration efficiency. Previous studies have shown modest impact of temperature on specific mussel species except at very low temperatures. This study investigates the effect of temperature on Utterbackiana implicata, a species native to North America. Methods: The filtration efficiency of mussels was studied at three different average water temperatures: 11.5 degrees C, 17 degrees C, and 23.5 degrees C. Four mussels were placed in approximately 1 L of conditioned water, with one group of four mussels observed in each of the three temperature environments. Water turbidity was created using algae Instant Algae Shellfish Diet 1800 and assessed over time using a 2100P turbidimeter (Hach, USA). Experiments were conducted in triplicate. Appropriate control experimentation (without mussels) was also performed. Results: Filtration efficiency (DELTA turbidity/DELTA time) was 0.86±0.47, 2.06±1.18, and 0.64±1.22 NTUs/hr at average temperatures 11.5 degrees C, 17 degrees C, and 23.5 degrees C respectively. Conclusion: Variation in temperature over a modest range does not significantly impact the filtration efficiency of the mussel Utterbackiana implicata, which is consistent with prior published reports.

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