

Oyster Filtering in Response to Oil Exposure

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The Eastern Oyster

-*Crassostrea virginica*

-Bivalves (filter feeders that eat plankton and algae)

-Reach up to 20cm

-Predators: parasites, birds, and humans

-Reach sexual maturity at 7 weeks

-Females release more than 100mil eggs per season

-Only 1% reach the next stage of maturity

-Found on Atlantic coast from Canada to Brazil

-Prefer salinity of 10-28 ppt but can survive in a wide range

-Filter feed an average of 6.8 L per hour

Question and Hypothesis

Question: Does exposing an oyster to oil affect filter feeding rates?

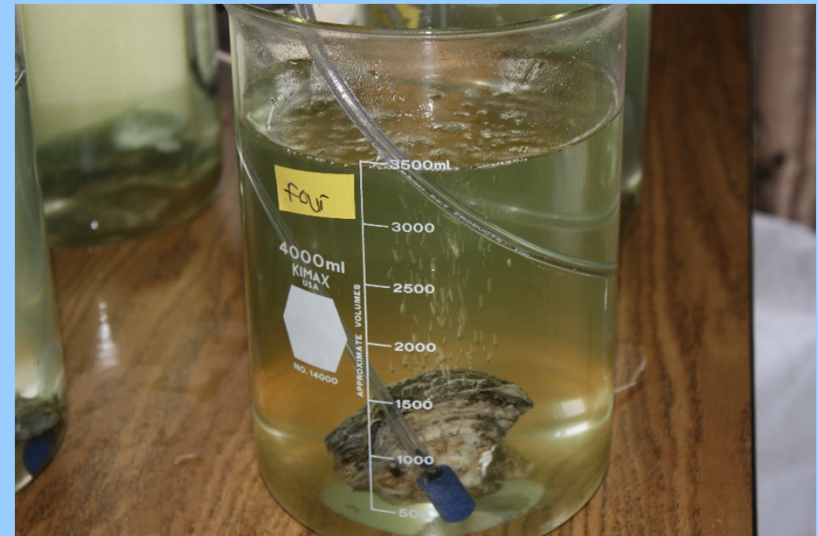
Null Hypothesis: Filtering rate is not affected after an oyster is exposed to oil.

Alternative Hypothesis: Filtering rate decreases after an oyster is exposed to oil.



Methods

- Collected 3 oysters within about 10% weight of each other
- Measured length, width and weight of each oyster
- Exposed 2 oysters to 1 mg/L of Naphthalene for 4 hours
- Filled three 3500 mL oxygenated beakers with 2500 mL of 5 ppt water
- Put 1 oyster in each beaker and allow time for the oysters to adjust

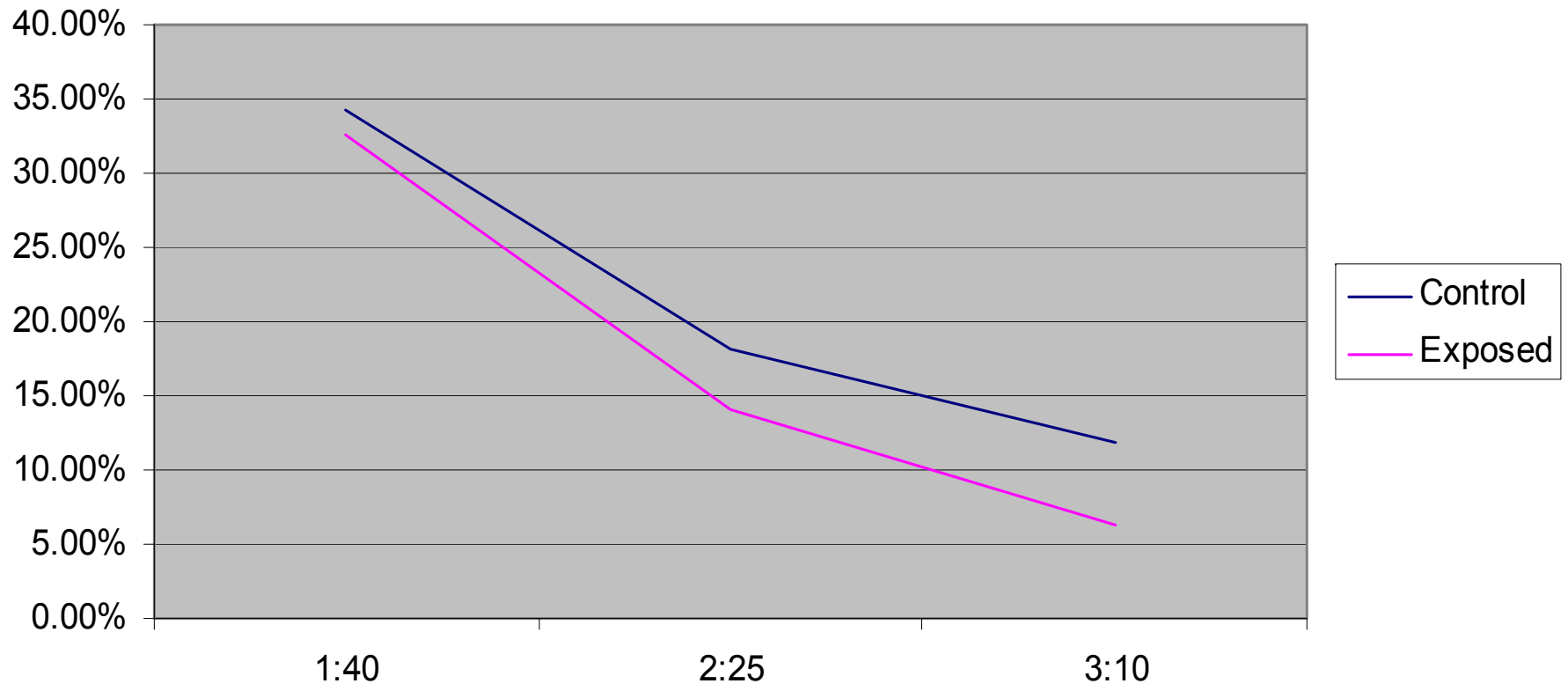


Methods Continued

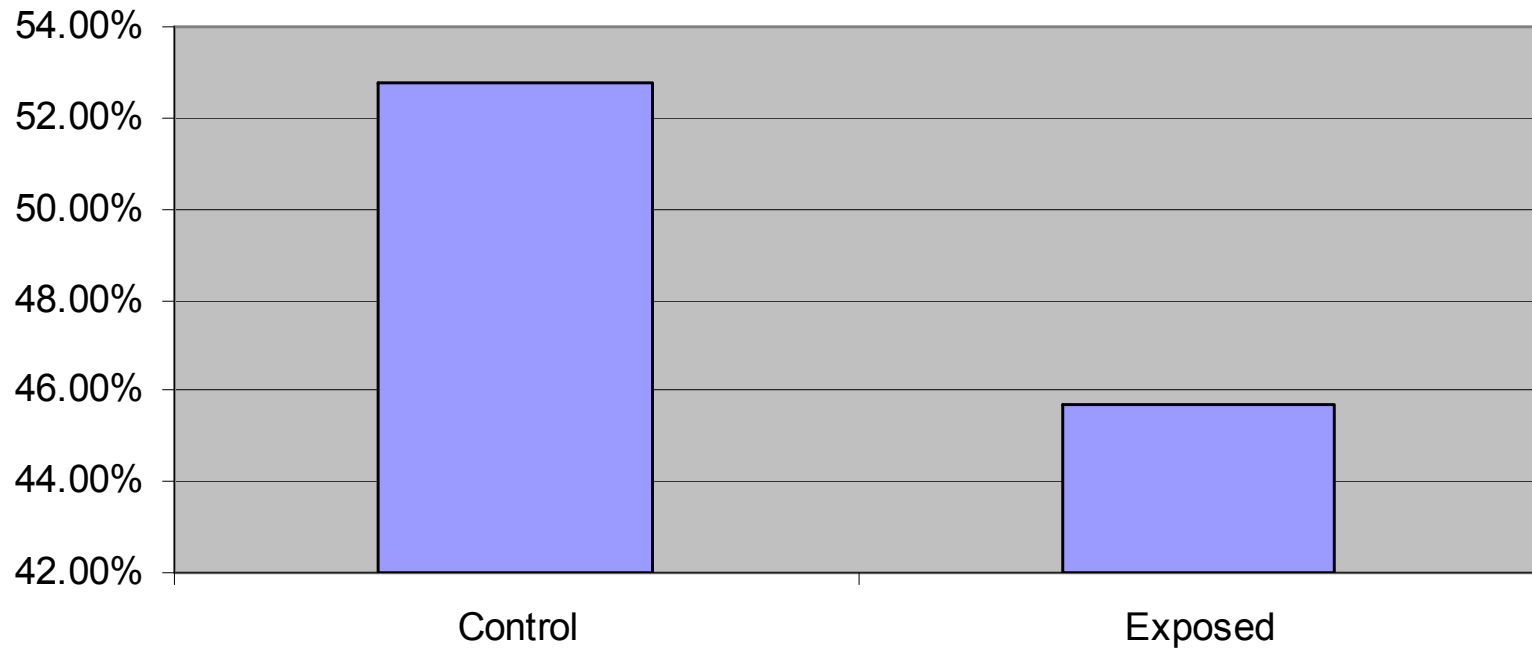
- After 24 hours, oysters were fed 5 mL of a phytoplankton culture
- An initial 5 mL was taken from each beaker
- Filtered 0.5 mL of water through 20 micron filter paper
- Counted plankton cells on a grid slide using compound microscopes
- Two randomly selected squares
- Extrapolated total cell count in 1 mL by multiplying ($\text{Avg} * 64 * 2 = \text{cells}/1 \text{ mL}$)
- Repeated at chosen times



Percent Decrease Over Time



Overall Percent Filtered



Conclusion

Based on the data collected, our null hypothesis was supported. Because of the standard human error, of 10%, our data was inconclusive. While the exposed oyster showed a faster decrease, the difference between that and the exposed was not great enough to be considered an effect of the oil.

Other experiments have been conducted and show similar results. This could be because of the long period of time between exposure and data collection. Also, while the oysters were exposed, they could have not opened and therefore were not exposed to the oil. Our final option could be that the oysters were not affected at all. Further research would need to be conducted to test these hypotheses.

Bibliography

www.cen.acs.org “Deepwater Horizon Oil Spill’s Oyster Aftermath” by: Mark Schrope

www.amnh.org “The Effect of oil and Its Dispersants on the Eastern Oyster, *Crassostrea Virginica*”

[www. Tpwd.state.tx.us](http://www.Tpwd.state.tx.us)



Total plankton counted for this experiment: 43,983