Do Herbicides and Fertilizers Found in Surface Runoff Affect the Oyster (Crassostrea virginica) and Clam (Mercenaria mercenaria) Ability to Naturally Filter and Improve the Overall Water Quality of the Indian River Lagoon?

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The objective of this research was to determine if Eastern Oysters and Hard Shell Clams filtration ability to naturally filter and improve the overall water quality would be affected if the water contained herbicides and fertilizers which is commonly found in surface runoff that flows into the river water. The researcher hypothesized that the use of herbicides and fertilizers found in water would have different effects on filtration abilities on the oysters and clams. The researcher set up twelve, ten gallon tanks containing water from the lagoon into six groups of two tanks each. Each group contained ten oysters and ten clams. The first two tanks were the control tanks with no chemcials. The remaining ten tanks contained herbicides during phase I and fertilizers during phase II testing. All tanks were set up in a dark room to measure the turbidity changes every 30 minutes for eight hours. A light meter and an LED lantern were used to measure the turbidity. Different levels of herbicide and fertilizers were used for testing. Based on ANOVA statistical analysis, the Eastern Oysters and Hard Shell Clams can filter in water that contains fertilizers and herbicides with significant differences in the filtration rate. However, based on assessment of data by the researcher, the researcher suggests placing the mollusks in areas where increased levels of nitrogen have become a problem. The mollusks may be a useful tool to help eliminate some of the nitrogen from the water which will result in a healthier Indian River.

Awards Won:

Fourth Award of $500

American Statistical Association: Certificate of Honorable Mention

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his Companions Foundation for Giftedness and Creativity: Award of $1,000 for Water Technology