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Investigation of Growth Patterns due to Environmental Factors on the Surface of Bivalve shells with LIBS and Raman Spectroscopy[1]
ANDRIA PALMER, JOSEPH MAYS, JAMES AMOS, TOM DYNKA, LASZLO UJJ, University of West Florida — Environmental disturbances (such as temperature or chemical disturbances) can cause bivalve mollusk shells to grow faster or slower and cause changes in color and surface ring pattern. We have selected a few shells from our local habitat in Pensacola Beach, FL to analyze without sample treatment to determine what factors may have come into play during growth and use this as a way to analyze our marine environment. Laser Induced Breakdown Spectroscopy (LIBS) uses high energy laser pulses (355 and 532nm) to ablate the sample and create a micro-plasma from which emission spectra can be recorded. Based upon the analysis of intensities, wavelengths, and band patterns of spectral emission bands, the spatial qualitative elemental composition of the shell samples can be determined. Raman spectra were also recorded and correlated to molecules in the sample. By analyzing these measurements using LIBS-Raman spectroscopic techniques, we will be able to see how the local environment is effecting growth, with the largest chemical disturbance in the area being the BP Oil Spill in the Gulf in 2010. Therefore if samples are selected from this period of time it may be possible to identify the effects on shell growth.

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