DUQUETTE, AM*; MCCLINTOCK, JB; AMSLER, CD; PEREZ-HUERTA, A; HALL-SPENCER, JM; MILAZZO, M

University of Alabama at Birmingham, Birmingham, AL

University of Plymouth, England, University of Palermo, Italy

University of Alabama, Tuscaloosa, AL

amd82886@gmail.com

Effects of reduced pH on shell integrity and mineral composition of three common gastropods from a natural undersea CO2 vent community off Vulcano Island, Italy

Patella caerulea, Patella rustica, and Hexaplex trunculus are widespread Mediterranean gastropod mollusks that play crucial roles in benthic ecosystem dynamics. Individuals occur in shallow, sublittoral habitats near Vulcano Island, Italy, where an undersea CO2 vent provides a gradient of seawater acidification mimicking future predicted levels of ocean acidification. Individuals were collected from three sites with declining pH [ambient (pH 8.18), medium (pH 8.05) and low (pH 7.49)]. Scanning electron microscopy provides a qualitative comparative assessment of micro-scale impacts of shell dissolution of individuals from the three sites. Dissolution of shells was clearly evident at the medium (smoothing of outer shell) and low (pitting and holes) pH sites. X-ray diffraction (XRD) provides a quantitative comparative assessment of carbonate composition in shells of individuals from the three pH sites. The calcium to magnesium ratio, as well as the aragonite to calcite ratio, changes from one site to the next. Electron backscatter diffraction (EBSD) will provide qualitative data on the microstructure of the three types of gastropod shells from the three sites. This study indicates that end of century anticipated levels of ocean acidification are capable of causing alterations in shell mineral composition and integrity that may render individuals more susceptible to infection and predation.