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Paper No. 74-4

Presentation Time: 9:00 AM-5:30 PM

DOES SEA ICE COVER AFFECT GROWTH IN JUVENILE STAGES OF THE ANTARCTIC SCALLOP, *ADAMUSSIUM COLBECKI*?

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The scallop *Adamussium colbecki* is a potentially important paleoenvironmental proxy for Antarctic coastal waters, but questions about its growth and lifespan must first be resolved to contextualize any sclerochronological data. *Adamussium colbecki* has shell growth lines (striae) that are thought to form fortnightly during juvenile growth. Narrowly spaced striae are assumed to represent slow winter growth; widely spaced striae represent fast summer growth. This project compares growth rates of specimens collected from Explorers Cove (EC) and Bay of Sails (BOS) in McMurdo Sound, Ross Sea, Antarctica. Both sites support *A. colbecki* populations in constant year-round temperatures near the seawater freezing point (~ -1.97°C), but EC has multi-annual sea ice and BOS sea ice melts completely each austral summer. We hypothesize that the different ice regimes could affect nutrient availability: greater primary productivity in BOS during summer ice melt may lead to higher summer growth rates in juveniles (< 50 mm shell height) compared to EC juveniles.

To test the hypothesis, the first 50 mm of growth from 5 BOS and 5 EC specimens (all adults >50 mm) were photographed at 25x magnification. Increments between discernable striae were measured along the axis of maximum growth using the iSolution Lite imaging system. Mean increment width was calculated to homogenize winter and summer growth (means for each specimen and each site) and to isolate peak summer growth (largest 10% of increments for each site). If higher productivity leads to faster growth, BOS specimens should have higher mean increment widths for both homogenized growth and for peak summer growth.

Juvenile *A. colbecki* from BOS and EC showed no difference in mean striae increment width for homogenized growth ($t=-0.215$, $df=7.989$, $p=0.83$). Mean increment width for each site was equal (0.24 mm). Peak summer growth was slightly higher for BOS (0.49 mm) than EC (0.47 mm), but the difference was not statistically significant ($t=-1.44$, $df=145.6$, $p=0.15$). If juvenile striae represent fortnightly growth, these results indicate that growth rates do not differ between EC and BOS, despite different ice regimes. EC may have additional nutrient sources, possibly from sea ice algae. Alternatively, nutrient availability may not be a primary determinant of growth rate in *A. colbecki*.

Session No. 74--Booth# 260

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Sunday, 25 September 2016: 9:00 AM-5:30 PM

Exhibit Hall E/F (Colorado Convention Center)