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GSA Connects 2022 meeting in Denver, Colorado

Paper No. 63-29

Presentation Time: 2:00 PM-6:00 PM

LIVE-DEAD FIDELITY: THE MODERN DEATH ASSEMBLAGE OF THE ANTARCTIC SCALLOP IS BIASED BY SEA-ICE STATE

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The Antarctic scallop, *Adamussium colbecki*, is an ecosystem engineer—a key organism that links benthic, pelagic and planktonic habitats—yet despite its genus evolving in the Oligocene of Antarctica, little is known about its fossilization process. In particular, does sea-ice state (multiannual or annual sea ice) affect whether scallop living populations are faithfully represented in modern Antarctic death assemblages? Annual sea ice melts out each year allowing sunlight and storms to reach the seafloor in contrast to multiannual sites, where light and storms are dampened. We hypothesize that *A. colbecki* under multiannual sea ice would have higher fidelity in live-dead abundance and size-class distributions than storm-affected annual sea-ice sites.

All sites were located in western McMurdo Sound, Ross Sea, Antarctica: Two multiannual sea-ice sites in Explorers Cove and two annual sites (one in the Ferrar Glacier embayment and the other offshore of the Wilson Piedmont Glacier). Live and dead scallops were counted and binned into small (~1–5 cm), medium (~5–8 cm), and large (>9 cm) size classes based on underwater video that represented ~10 m² spatial area. Results indicate that annual sea-ice sites were highly biased toward the living assemblage (~100 live to 1 dead scallop) in contrast to multiannual sites where live-dead associations were more equitable (~1 to 3 live scallops for every 1 dead scallop). Size-class distributions were remarkably similar for modern populations from both sea-ice states (chiefly medium-to-large scallops represented) but only the multiannual death assemblages faithfully reflected the live size distribution; annual sites could not be tallied because of few dead scallops. Thus, sea-ice state does affect live-dead fidelity for modern death assemblages in polar environments. Because of their high fidelity between the living and modern death assemblage, we further predict that multiannual sea-ice sites may provide one of the best fossil records for assessing paleopopulation dynamics of Antarctic mollusks.

Session No. 63--Booth# 112

[D25. Paleontology: Recent Developments in Paleoecology and Taphonomy \(Posters\)](#)

Sunday, 9 October 2022: 2:00 PM-6:00 PM

[Exhibit Hall F \(Colorado Convention Center\)](#)

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