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A first multi-temperature culture study of benthic foraminiferal shell chemistry: oxygen and carbon isotopic results

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Stable oxygen and carbon isotopes of foraminiferal carbonate are two standard proxies employed in paleoceanography. Over the years it has become clear that significant deviations occur between biogenic and inorganic calcite due to different life processes. Laboratory culture experiments can provide a powerful way to study the factors that influence benthic foraminiferal shell chemistry. Several species of benthic Foraminifera were collected from four locations (the Skagerrak and Gullmar Fjord, Sweden; the Bahamas; and the Charleston Bump, United States; 70 to 800 m water depth), and were grown in replicate microcosms under controlled physical and chemical conditions at 4, 7, 14, and 21˚C. To our knowledge, this six-month study was the first multiple-temperature benthic foraminiferal culture experiment. Seawater was recirculated through the system from a single reservoir to insure that the chemical and isotopic composition of the culture water was well characterized, and the same for all microcosms. *Bulimina* species (*B. aculeata* and *B. marginata*) were the most successful, adding chambers at all four temperatures and reproducing in culture at 7 and 14˚C. We will present oxygen and carbon isotopic data from whole specimens born in culture, and from chambers added in culture and obtained by laser microdissection. These isotopic results will be compared with culture system temperature and chemistry.