



The isotopic composition of the calcareous and (facultative) agglutinated foraminifer *Melonis barleeanus*

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Melonis barleeanus is a calcareous foraminiferal species widely used in paleoceanographic studies. Recently, a study highlighted the presence of sedimentary particles within the test of modern and fossil *M. barleeanus* specimens from the Arctic Ocean and the Mediterranean Sea. For these specimens, the influence of sedimentary (quartz- and feldspar- like) particles on the test isotopic composition was estimated based on a mixing model. Specifically, it was modeled that the $\delta^{18}\text{O}$ of this foraminiferal species would increase by $\sim 0.9\text{--}2\text{‰}$ if ten weight percent of sedimentary grains were to be analyzed together with the foraminiferal calcite.

In this study, we investigated the oxygen and carbon isotopic composition of *M. barleeanus* specimens characterized by the presence of silicate grains embedded in their calcareous tests (i.e. calcareous and facultative agglutinated specimens). Isotope measurements were performed using a mass spectrometer and an ion microprobe (i.e. secondary ion mass spectrometer or SIMS). The latter technique allowed the measurement of carbon and oxygen isotopes on foraminiferal calcite, quartz- and feldspar- like grains embedded in the test, and regions of the test characterized by calcite and grains. Our results show that oxygen isotopes are more affected than carbon isotopes by the unusual biomineralization strategy of *M. barleeanus*, in particular when in-situ analytical techniques (e.g., SIMS) are used.