



Species-specific ingestion of organic carbon by deep-sea benthic foraminifera and meiobenthos: In situ tracer experiments

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ABSTRACT: We measured organic carbon uptake rates by deep-sea benthic foraminifera and studied differences among species, living depth, and seasons to investigate how these protists contribute to carbon consumption on the deep-sea floor. In situ feeding experiments using ^{13}C -labeled algae were carried out in the central part of Sagami Bay from 24 to 29 November 2001 and 1 to 12 April 2002. Our results indicate that carbon assimilation rates were higher in shallow infaunal species (*Uvigerina akitaensis*, *Bulimina aculeata*) and lower in intermediate (*Textularia kategatensis*) and deep infaunal species (*Chilostomella ovoidea*). Some shallow and intermediate infaunal species showed higher carbon uptake in spring than in autumn. In total, benthic foraminifera assimilated C at $5.8 \pm 4.8 \text{ mg m}^{-2}$ and $2.0 \pm 1.3 \text{ mg m}^{-2}$ (in spring and in autumn, respectively) of labeled algae within 2 d, which was more than that by total metazoans ($1.5 \pm 0.4 \text{ mg m}^{-2}$ and $0.4 \pm 0.1 \text{ mg m}^{-2}$, respectively). Deep-sea benthic foraminifera rapidly ingest large amounts of carbon and may play an important role in carbon consumption on the deep-sea floor. Different responses to algal carbon among species may explain foraminiferal assemblages and shifts after environmental changes, such as seasonal pulses of organic matter supply.

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