



## The trophic significance of bacterial carbon in a marine intertidal sediment: Results of an in situ stable isotope labeling study

van Oevelen, Dick, Leon Moodley, Karline Soetaert, Jack J. Middelburg

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**ABSTRACT:** We report the results of an in situ tracer experiment in an intertidal sediment, where bacterial carbon was tagged with stable carbon-isotope label, after the injection of  $^{13}\text{C}$ -glucose. The appearance of label in bacteria (based on label incorporation in bacteria-specific, phospholipid-derived fatty acids) and subsequent transfer to meiobenthos (group level) and macrobenthos (species level) was followed for 36 days. The label dynamics of benthic taxa were either fitted with a simple-isotope model or evaluated against enrichment in bacteria, to derive the importance of bacterially derived carbon for the meiobenthos and macrobenthos. Although selective uptake of bacteria was evident, as 2.4 times more bacterial carbon was grazed as expected from indiscriminate feeding, bacterial carbon accounted on average for only 0.08 and 0.11 of the carbon requirements of meiobenthic and macrobenthic taxa, respectively. Additionally, the contribution of bacterial carbon to total carbon requirements did not depend on the living/feeding depth in the sediment or organism size (evaluated over a size range of four orders of magnitude). The observed overall low contribution of bacterial carbon implies that most intertidal benthic fauna depend primarily on other carbon resources that may assert a stronger control on the structure of intertidal-sediment communities.

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