

AN ISOTOPE DILUTION APPROACH TO ASSESS THE NUTRITIONAL VALUE OF DETRITUS

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Detritus represents an important, though heterogeneous, food source for benthic organisms. Bulk measurements such as C/N, lipids or amino acids are often used as food quality indicators. But what is taken up specifically from the detritus pool still stays largely unknown. Labelling food sources provides a powerful approach to study transfer in food webs, but due to its heterogeneity and unknown composition, it is difficult to produce labelled detritus.

We present an inverse approach: the deposit-feeding polychaete *Capitella capitata* was isotopically labelled by feeding them enriched ^{13}C and ^{15}N diatoms. After the enrichment period, the organisms were subjected to different treatments. When organisms take up carbon and nitrogen from unlabelled detritus, their isotope enrichment will decrease in proportion to the carbon and nitrogen availability of the food source to the deposit feeder.

In a preliminary experiment bulk $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ measurements were performed to investigate if we see the expected isotope dilution. Three treatments were applied: the labelled polychaetes were placed in either burnt sediment, which represents starvation, in high quality natural sediment, which represents a rather good food source, or in burnt sediment with algae, which represents an excellent food source. The expectations were that the amount of label would stay constant in the starvation treatment and decrease in the high quality sediment and algal treatment, with the latter treatment showing the highest degree of isotope dilution. The method does work, but there were differences between the dilution of $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$.

In a second experiment not only bulk $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ measurements, but also isotope measurements of fatty acids and amino acids were performed to study which specific compounds are taken up from detritus. Four treatments were applied: burnt sediment (starvation), low and high quality natural sediments (resp. a rather poor and a rather good food source) and burnt sediment with diatoms (excellent food source). The compound specific analyses of the labelled polychaetes should enable us to discern which compounds are preferably taken up from the detritus by *Capitella capitata* and should give us an idea about the carbon and nitrogen availability of these compounds in the different treatments.