TROPHIC RESOURCE AND POSITION OF METAZOAN MEIOBENTHOS AT CONTRASTING SUBTIDAL SEDIMENTS: COMBINING CARBON AND NITROGEN STABLE ISOTOPE ANALYSIS AND LABELLING OF FOOD RESOURCES

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Two different approaches were used to determine the trophic position and food resources for meiobenthos: (i) the natural abundance of carbon and nitrogen stable isotopes ratios and (ii) uptake of ^{13}C labelled diatom *Skeletonema costatum* and Prymnesiophyte *Phaeocystis*. Two contrasting sites in the southern North Sea were investigated: one with fine grained sediment located close to the coastline and another with highly permeable sediments. ^{13}C and ^{15}N signatures were analysed in sediment Particulate Organic Matter (POM), water Suspended Particulate Matter (SPM) and in different meiobenthic taxa at three different sampling periods (prior, during and after the spring bloom deposition) at two sediment depths (0-1 and 4-5 cm). In the fine grained station, surface-dwelling nematode species feed on fresh organic matter (OM) year-round while deeper dwelling nematodes feed on older material. *Sabatieria* and *Richtersia* feed on surface POM independent of the sediment horizon they were encountered in. Copepods' isotopic signatures indicated a chemoautotrophic food source. In the coarser sediment no vertical differences in food sources were detected. In the tracing experiment both the diatom and *Phaeocystis*–derived OM cascaded into meiobenthic biomass in low but similar percentages. *Phaeocystis*–derived OM might therefore be an important food source for the benthic environment. Label uptake was highest at the upper cm in both stations. In the coarse sediment meiobenthic label uptake per unit of organismal carbon was higher, probably as an adaptation to low availability of labile OM. The so-called stout nematodes showed lower uptake compared to the slender nematodes. Their sudden increase in densities shortly after a phytoplankton bloom must rely then on their life-history characteristics. In finer sediments *Enoploides* presented the highest uptake, indicating other food sources besides meiobenthic preys. *Sabatieria* showed the highest uptake at the 1-3cm layer suggesting migration to the sediment surface to feed on fresher OM. This behaviour explains its faster response in terms of densities after a phytodetritus deposition event. Generally total uptake was low and not nearly sufficient to maintain nematodes feeding requirements.