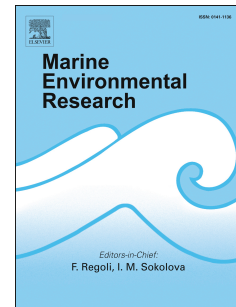


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# Temporal dynamics in a shallow coastal benthic food web: insights from fatty acid biomarkers and their stable isotopes

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## ABSTRACT

We investigated the temporal variation of pelagic and benthic food sources in the diet of benthic taxa at a depositional site in the Southern Bight of the North Sea by means of fatty acid (FA) biomarkers and compound-specific stable isotope analysis (CSIA). The taxa were the non-selective deposit feeding nematodes (*Sabatieria* spp. and 'other nematodes'), and three dominant macrobenthic species: two true suspension-deposit feeders (the bivalve *Abra alba* and the tube dwelling polychaete *Owenia fusiformis*) and the suspected predatory mud-dwelling anemone *Sagartia* sp.. These species make up on average 16% (*Abra alba*), 17% (*Sagartia* sp.) and 20% (*Owenia fusiformis*) of the biomass in the *Abra alba*–*Kurtiella bidentata* community in this area. Phytoplankton dynamics in the suspended particulate matter of the water column as inferred from cell counts, chlorophyll-*a* and organic carbon content were clearly visible in animal FA composition as well, whereas phytodetritus dynamics in the sediment FA composition were less clear, probably due to patchy distribution or stripping of FA by macrofauna. Nematodes appeared to assimilate mainly Polyunsaturated Fatty Acids (PUFAs) from their sedimentary environment and were further non-selectively accumulating more (*Sabatieria* spp.) or less ('other nematodes') FA from the deposited phytodetritus. In contrast, *Abra alba* FA composition was consistent with a diatom-dominated diet and consumption of *Phaeocystis* was observed in *Owenia fusiformis*, whereas *Sagartia* sp. showed evidence of a predatory behaviour. While the total FA content in *Owenia fusiformis* remained constant throughout the year, *Sagartia* sp. doubled and *Abra alba* increased its FA level more than 10-fold in response to the organic matter deposition from the phytoplankton bloom. This leads to the conclusion that there is no resource partitioning between non-selective deposit feeding nematodes and the suspension-deposit feeding macrobenthic organisms, suggesting they belong to separate parts of the benthic food web.

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