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Trophic resource use by macrozoobenthic primary consumers within a semi-enclosed coastal ecosystem: stable isotope and fatty acid assessment

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ABSTRACT

The diet of different macrozoobenthic trophic groups was investigated in the Arcachon Bay — a semi-enclosed macrotidal ecosystem that shelters the largest *Z. noltei* seagrass meadow in Europe — in early spring and late summer 2009, using stable isotopes and fatty acids. Fatty acid profiles and literature information about the biology and physiology of benthic consumers were combined to identify the main organic matter sources for the benthic primary consumers. An isotope mixing model was then run to evaluate the contribution of each organic matter source to each identified trophic group (suspension feeders, sub-surface deposit feeders, micro-and macrograzers, suspension-oriented interface feeders and deposit-oriented interface feeders). Variations in organisms' diet with respect to both habitats (intertidal seagrass meadows, intertidal bare sediments and subtidal bare sediments) and study periods were also investigated. At the scale of this study, it appeared that the diet of macrozoobenthos primary consumers was based exclusively on autochthonous material (no use of terrestrial organic matter): mainly microphytobenthos, seagrasses and their epiphytes, and phytoplankton. In addition, the different trophic groups relied on different organic matter pools: for instance, suspension feeders mainly fed on microphytobenthos and phytoplankton, whereas subsurface deposit feeders fed on microphytobenthos, decayed seagrasses and bacteria, and grazers mainly fed on microphytobenthos, and seagrasses and their epiphytes.