
High spatial resolution perspectives on an intertidal mudflat food web

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Résumé

The high primary production of intertidal mudflats, especially of the superficial layer of microphytobenthos (MPB), provides a large potential food source to consumers, which include cultured oysters and invertebrates important as prey for fish and birds. Yet the trophic importance of MPB varies spatially relative to other resources, including phytoplankton and imported macrophyte material. Furthermore, the patchy distribution of MPB suggests, at least in places, that primary production can be in excess of in situ consumption. Here, MPB biomass may be exported and may support more distant food webs. An understanding of what may maintain these highly productive patches, and of the spatial interactions of MPB with local consumers, would thus help the management of mudflat aquaculture and fisheries. This study focusses on a representative locality within the Bay of Bourgneuf, the fourth most important bay in France for oyster aquaculture output. We have collected data at high spatial resolution and over multiple seasons, on community diversity and biomass, and use stable isotopes of carbon and nitrogen to reveal the pathways of organic matter compartments among consumers. Here we present preliminary data for one season. We describe spatial patterns in MPB and consumer biomasses and we quantify relationships between putative resources and consumers in a spatially explicit manner.

Mots-Clés: food web, mudflat, stable isotopes, spatial analyses, MPB, benthic, invertebrates

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