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Food webs and species interactions within fouling communities at offshore artificial hard substrates

Fouling communities are highly affected by a variety of environmental factors, such as water depth and substratum orientation, as well as by species interactions. For example, even slight modifications in the abundance of a species can alter the trophic interactions of the whole community. The aim of the present study is to disentangle food webs (C-flow) and species interactions within fouling communities in Belgian offshore wind farms as to evaluate the impact of artificial reef communities onto the natural surrounding ecosystem. First, the possibility of a “biofilter” action from the organisms that comprise a fouling community will be studied by measuring the feeding/biodeposition ratios. Second, species trophic interactions in (a) different offshore wind farms habitats (e.g. erosion protection layer and piles), (b) a variety of depths and (c) in different taxa will be investigated through stable isotope analysis. Finally, pulse chase experiments will be conducted in order to investigate the path that carbon follows (¹³C labeled) in the food chain and quantify what is accumulated, deposited and lost through the metabolic process. From the above, a model of the fouling community species interactions will be constructed. This study will provide concrete knowledge on food webs and habitat formation in offshore wind farm fouling communities regarding both their ability to filter organic particles and their interactions with other taxa inhabiting the same substratum, forming the basis for further exploration of the impact of offshore wind farms on the southern North Sea ecosystem functioning. This research is part of the “Functional biodiversity in a Changing sedimentary Environment: Implications for biogeochemistry and food webs in a managerial setting, FaCE-It” project.

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