

Linking microbial biodiversity to the functioning of marine tidal flat ecosystems

Bogorad Rita¹, Stock Willem¹, Moens Tom², Jesus Bruno³, Hubas Cedric⁴ and Sabbe Koen¹

¹ Laboratorium voor Protistologie en Aquatische Ecologie, Universiteit Gent (PAE-UGent), Krijgslaan 281/S8, 9000 Gent, Belgium
E-mail: margarita.bogorad@ugent.be

² Marine Biology Research group, Ghent University, Krijgslaan 281/S8, 9000 Ghent, Belgium

³ Université de Nantes: Laboratoire Mer Molécules Santé (MMS), BP 92208, 44322 Nantes Cedex 3, France

⁴ National Natural History Museum Paris: Biologie des Organismes et Ecosystèmes Aquatiques (MNHN-BOREA), UMR BOREA, DMPA, Secrétariat, 61 rue Buffon, 75005 Paris, France

Despite the fact that tidal flat ecosystems are dynamic and harsh environments, they are highly productive and support multiple coastal ecosystem functions and services. This high functionality is mainly driven by diverse biofilm inhabiting microbial community, which is adapted to thrive in this changeable habitat. These microbial biofilms form the basis of coastal benthic food webs and protect the sediments from erosion.

In the framework of the BIO-Tide project (EU Horizon 2020 ERA-Net COFUND BiodivERsA, www.bio-tide.eu) the link between the taxonomic and functional biodiversity and the functioning of tidal flat biofilms was studied during two field campaigns. In the summer of 2017, the diversity of microbial communities of two contrasting intertidal sediments (sand and slit) of Bay of Bourgneuf (France) was studied in relation to carbon fluxes in the benthic food webs (as assessed using a carbon-13 SIP pulse-chase field experiment).

In the summer of 2018, we investigated diurnal changes in microbial composition, diversity, and activity during low tide at a site in the Westerschelde estuary (The Netherlands). In our presentation, we will show the results of 16S and 18S rRNA amplicon sequencing-based microbial diversity assessments in relation to differences in labeled carbon incorporation between the sediment types (2017) and changes in the ecosystem functioning during the tidal and diurnal cycle (2018).

Keywords: Tidal flat ecology; Benthic biofilm; RNA metabarcoding; Carbon flux; Stable isotope probing; Functional biodiversity