

Bioturbation as a key driver of microbial community structure in marine surface sediment

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Even though macrofaunal bioturbation has for a long time been recognized as a key driver of benthic respiration and the carbon cycle in marine surface sediment, its importance in controlling the community assembly of microorganisms has been largely ignored. Here we present research which shows that bioturbation is a main driver of microbial community assembly in marine surface sediment, from the domain-level, at which bioturbation controls the relative abundances of Bacteria and Archaea, all the way to the level of operational taxonomic units. Hereby different bioturbation behaviors, such as porewater ventilation and sediment reworking, which vary with location and the community structure of macrofauna, seem to influence microbial community structure differently, as a result of their divergent impacts on sediment redox chemistry and electron donor compositions. These differential impacts of ventilation and reworking provide insights into the relative importance of electron acceptors versus electron donors in controlling sediment microbial community structure, and more generally into the variables, which control the distribution of microorganisms and their catabolic activities in marine sediment.