

COMPARISON OF AMMONIA OXIDIZING BACTERIAL PHYLOTYPES AND FUNCTION BETWEEN INTERTIDAL ROCKY BIOFILMS AND SEDIMENTS OF THE DOURO RIVER ESTUARY, PORTUGAL

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We analyzed the phylogenetic composition of ammonia-oxidizing bacteria of the class α -Proteobacteria in samples from four sites in the Douro River estuary, Portugal. In addition, we evaluated relationships between AOB assemblage composition with environmental variables and N-biogeochemistry (nitrification rates, net NO_3^- , NH_4^+ and NO_2^- fluxes). Cluster analysis of denaturing gradient gel electrophoresis profiles showed differences in AOB assemblage composition between intertidal rocky biofilms and intertidal sediments, with no clear spatial or temporal differences within each environment. All sequences obtained from intertidal rocky biofilm sites exhibited phylogenetic affinity to *Nitrosomonas* lineages, whereas a majority of the sequences from the intertidal sediment sites were most similar to marine *Nitrosospira* lineages. Hierarchical cluster analysis based on environmental variables identified two main groups of samples. The first contained samples from intertidal rocky biofilm sites that were characterized by high concentrations of NO_2^- and NH_4^+ , and high organic matter and Chl *a* content. The second group contained all of the intertidal sediment samples, these sites were characterized by lower values of these variables. In addition, rocky biofilms sites exhibited higher nitrification rates comparatively to intertidal sediments. Our results suggest that intersite differences in environmental and/or physical conditions led to the selection of particular populations of AOB, supporting different N-cycling regimes.