

P021 Distribution and diversity of the *nrfA* gene encoding nitrite reduction to ammonia in estuarine sediments

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Nitrate discharged into estuaries from sewage works and agricultural lands can be removed from estuarine sediments. Denitrification removes nitrogen to the atmosphere, but nitrate can be returned to ammonia by nitrate ammonification, which competes with denitrification. This process is considered to be catalysed by fermentative bacteria and sulphate-reducing bacteria. Molecular analysis of cloned *nrfA* genes amplified from DNA isolated from sediment enables identification of the bacteria responsible for nitrate ammonification. DNA was extracted from sediments at different depth from the River Colne at four sites down the estuary. Seasonal sampling showed *nrfA* genes to be present throughout the year at the Hythe, which is the most nutrified site close a sewage works. Analysis of the *nrfA* sequences showed two distinct clusters in the surface communities but a more homogeneous community in deeper sediments, presumably due to more stable conditions, less influenced by the overlying-water. Some *nrfA* clones from the sediments clustered with those from anammox reactors, but most of the Colne *nrfA* genes formed a unique distinct cluster. The phylogenetic origin of these clones is still uncertain with *nrfA* sequences showing ~60% identity to those from *Bacteroides*, *Shewanella* and *Wollinella*.