DGGE Analysis of Batch Culture of Nitrification-Denitrification Microbial Community Composition in the Marine Estuarine Sediment of Ago Bay

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Nitrification-denitrification bacterial community structure was studied by Denaturing Gradient Gel Electrophoresis (DGGE). Microbial community derived from the coastal marine sediment of Ago Bay, Mie Prefecture, Japan used in this study has been cultured with batch system. The study aimed to elucidate and to characterize the bacterial community structure for possible application in the reclamation of degraded habitats through microbial biodegradation. The phylogenetic compositions of bacteria assemblages within the different growth phases, was analyzed with PCR-DGGE for partial 16S rRNA fragment. In addition, functional genes, amoA, nirS, nirK, nosZ relating to nitrification and denitrification activities were also described on PCR-DGGE. Furthermore, DGGE bands extracted were cloned and sequenced. Chemical analysis revealed that nitrification and denitrification activity changed according to the cultivated stage. However, this was not clearly demonstrated in the banding patterns obtained from DGGE analysis. The present study is a part of the Ago Bay Environmental Restoration Project under the program of Japan Science and Technology Agency.

Keywords: Nitrification; Denitrification; Marine sediment; DGGE

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