

**B334** The Microbial Community Analysis in a Nitrogen Removing Bioreactor: Conventional and Fluorescence In Situ Hybridization (FISH) Monitoring of Proteobacteria and Nitrate Reducing bacteria in Activated Sludge

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The microbial community of a nitrogen removing bioreactors was examined by conventional and molecular techniques to identify the bacteria actively involved in the removal of nitrate. This study was combined conventional isolation of dominant nitrogen removing bacteria with the application of specific rRNA-targeted probe for the analysis of the microbial community structure of nitrogen removing bioreactors (NRB) having a stable nitrate removal in limited carbon source. Enumeration of plating onto three different agar-solidified medium showed  $6 \times 10^6$  CFU/ml to  $1.1 \times 10^9$  CFU/ml, and the number of nitrate reducing bacteria and nitrite oxidizing bacteria by MPN method were significantly different from each other NRB. 16S rRNA sequence analysis of 41 nitrate reducing bacteria indicated that the dominant nitrate reducing bacteria were rRNA group I *Pseudomonas* and *Pseudomonas* spp. The ratio of eubacteria to total bacteria was 60% to 90% and the beta subclass of Proteobacteria dominated in all NRB. The number of the predominant genus rRNA-group I *Pseudomonas* using fluorescent probe showed  $2 \times 10^3$  cell/ml to  $3.2 \times 10^3$  cell/ml.

**B335** The Variations of Bacterial Numbers and  $\beta$ -glucosidase Activity with the size fraction of DOM in Lake Soyang

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Effects of different molecular size fractions (0.1 $\mu$ m - 100,000 MW, 10,000 - 100,000 MW, 1,000 - 10,000 MW) of dissolved organic matter (DOM) on the bacterial number and extracellular enzyme activity from lake Soyang was investigated. Total bacterial number showed a peak in the fraction < 10,000 MW ( $1.1 \times 10^7$  cells ml<sup>-1</sup>) after 24 hr, and in the fraction 1,000 - 10,000 MW ( $8.4 \times 10^7$  cells ml<sup>-1</sup>) after 48 hr. Highest activity was found for 0.1 $\mu$ m - 100,000 MW fraction (550 - 1160 nmol l<sup>-1</sup> hr<sup>-1</sup>) but in the 1,000 - 10,000 MW fraction was lowest (1 - 14 nmol l<sup>-1</sup> hr<sup>-1</sup>). This result indicates that high molecular weight matters are regarded as important regulators for extracellular enzyme activity in Lake Soyang.