B045

Effects of Cadmium and Nutrient Salts Additions on the Community Structure of Bacteria in Wetland Sediments

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Bacteria in wetland soils play an important role in the material cycling and contribute to purification function of wetland Wetlands have often been applied to treat complex wastewater with various components including heavy metals and inorganic nutrients The aim of this work was to investigate effects of cadmium and nutrients salts additions on the bacterial community structure of wetland soils Cadmium was added as 0, 1, 10, 100, 1,000, 10,000 mg kg^{-1} into wetland soils for the 1st experimental set which lasted for 40 days. In the 2nd experimental set, N and P were added as 15 ppm and 1 5 ppm respectively along with 100 mg kg^{-1} of Cd, and it lasted for 50 days Changes of bacterial community structure were investigated by PCR amplification with 16S rRNA genes followed by T-RFLP analysis. The changes of bacterial community structure were observed, which indicates interactive influences of Cd and nutrients on microbial community in wetlands.

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B046

Comparison of the Bacterial Population in the Rhizosphere of *Phragmites communis* Collected from Geum River Area and Mangyung River Area

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This study was carried out to evaluate the ratio of activity per unit weight of rhizosphere soil of heterotrophic bacteria of *Phragmites communis* to the activity per unit weight of nonrhizosphere soil collected from Geum river and Mangyung river area. The population densities of heterotrophic bacteria distributed in the rhizosphere of *Phragmites communis* changes within the ranges of $4.4 \pm 1\,8 \times 10^7$ and $1\,7 \pm 0\,5 \times 10^8$ cfu g^{-1} dry weight In the area influenced by sea water, the number of bacteria in the rhizosphere of *Phragmites communis* and in the soil of nonrhizosphere differs by about ten fold Distribution ranges of amylolytic bacteria showed between $1\,9 \pm 0\,4 \times 10^6$ and $3\,0 \pm 1.2 \times 10^6$ cfu g^{-1} dry weight Distribution ranges of cellulolytic bacteria showed $1\,3 \pm 0\,5 \times 10^7$ cfu g^{-1} dry weight in Seochon area and $5\,6 \pm 2\,3 \times 10^6$ cfu g^{-1} dry weight in the area along the Mangyung River According to the analysis by 16S
r DNA technique, dominant genera were Proteobacteria β group (5 strains) among 13 isolates near Geum river area and Proteobacteria γ group(13 strains) among 29 isolates near Mangyung River area

B047

Microbial Community Structures and Activities in Nitrifying Biofilm Reactors: Effect of Ammonia and Organic Carbon Loads

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We operated nitrifying biofilm reactors with synthetic wastewater of different ammonia and organic carbon loads In the first experiment, hydraulic retention time (HRT), dissolved oxygen, and temperature of the reactors were maintained as 12 hr, 4 0 mg/L, and 24 0℃, respectively, and the concentrations of ammonia and chemical oxygen demand (COD) were varied from 13 to 120 mg/L and 33 to 300 mg/L, respectively Below the ammonia and COD concentrations of 80 and 200 mg/L, the efficiencies of ammonia and COD removal were more than 90%, and slightly higher with the concentrations decreased The removal efficiency decreased significantly with 120 mg/L of ammonia and 300 mg/L of COD In another experiment, different ammonia and organic carbon loads were given by changing HRTs Whereas the efficiencies of ammonia and COD removal were over 90% with the HRTs of 6, 8, and 12 hrs, they reduced significantly with 4 hr HRT. When community structures were analyzed through denaturing gradient gel electrophoresis, the banding patterns were similar between different ammonia and COD loads, and most bands were corresponded to the members of β- and γ-proteobacteria.

B048

Microbial Community Structures and Activities in Nitrifying Biofilm Reactors: Effect of Dissolved Oxygen Concentrations

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To determine how the level of dissolved oxygen (DO) affect the microbial community and efficiency of biological nitrogen removal process, nitrifying biofilm reactors were operated with DO concentrations of 2, 4, 6, and 8 mg/L The hydraulic retention time and temperature of the reactors were maintained as 12 hr and 24 0℃, and the concentrations of ammonia and chemical oxygen demands (COD) of synthetic wastewater were 40 and 100 mg/L, respectively The removal efficiency of ammonia was more than 90% in reactors of which DO values were 4, 6, and 8 mg/L, but the efficiency was below 80% in a reactor with the DO concentration of 2 mg/L The concentrations of nitrate were higher as the DO concentrations increased On the other hand, the removal efficiency of COD was over 90% regardless of the DO concentrations Microbial community structures of biofilms in the reactors were analyzed through denaturing gradient gel electrophoresis of 16S rDNA and compared between different DO concentrations as well