

The associations *Quercus mongolicae*-*Pinetum densiflorae* assoc. nov., *Quercus serratae*-*Pinetum densiflorae* assoc. nov. and *Sasol*-*Pinetum densiflorae* Yim et al. 1990 belong to the order Rhododendro-*Quercetalia* were distributed in the inner Korean Peninsula and the Cheju Island. The association *Castanopsis*-*Pinetum densiflorae* assoc. nov. belong to the order *Camellietales japonicae* Oda and Sumata 1966 was located in the warm temperate region including island region of the south-west coast.

B536 Vegetation Structure and Distribution of Exotic Plants with Geomorphology and Disturbance in the Riparian Zone of Seunggi Stream, Incheon

Dong Ho Shin¹ and Kang-Hyun Cho²

¹Graduate School of Education, Inha University;

²Department of Biological Sciences, Inha University

We investigated flora and vegetation structure of exotic plants along stream geomorphology and disturbance factors in the riparian zone of Seunggi stream, Incheon. Total 53 exotic plant species were found in the riparian corridors of Seunggi stream. The percentage of exotics ranged from 25% to 33% of total species richness, and its mean value was 24% in the whole riparian area. The percentage of exotics reflected the vulnerability of riparian zones to plant invasions by disturbances, and it could be used as an indicator of riparian system dysfunction. The distinct distribution patterns of exotic plants did not found in the lateral topographic features of the stream. Invasion and proliferation of the exotic plants were somewhat remarkable at terraces and bank slopes of the stream. Among various disturbance factors, plowing and trampling were important on the invasion of exotic plant communities of Seunggi stream.

B537 Effect of Salt Stress on Structure and Function of the Methanogenic Archaeal Community in Rice Field Soil

Jaai Kim^{*} and Kang-Hyun Cho

Department of Biological Sciences, Inha University

The effects of salt stress on methane production and structure of the methanogenic archaeal community in rice field soil were investigated using gas chromatography and culture-independent molecular techniques. Addition of salts above 100 mM NaCl to soil slurries resulted in the suppression of CH₄ production, decrease of H₂ accumulation, and a transient accumulation of acetate. At the initial stage of methanogenesis, archaeal community was dominated by *Methanosarcinaceae*, rice cluster I, and *Methanosaetaceae*. *Methanomicrobiaceae* was not detected and three novel groups, rice cluster IV, rice cluster V, and deep-sea hydrothermal vent euryarchaeotic group 6, were appeared after 45 days of anaerobic incubation. Under salt stress of 300 mM NaCl, relative abundance of *Methanosarcinaceae* was increased, whereas methanogenic community structure of 500 mM NaCl was similar to that of control. Salt stress affected therefore not the species composition but the relative abundance of methanogenic archaea in anoxic rice field soils.

B538 Removal Efficiencies of Nitrogen and Phosphorus in the Microcosm with Artificial Floating Island of *Iris pseudoacorus*

Keun-Yea Song^{*} and Kang-Hyun Cho

Department of Biological Sciences, Inha University

The removal efficiencies of N and P by artificial floating island of *Iris pseudoacorus* L. were examined in three different microcosms with 6 L of polluted pond

waters - control, addition of floating coir mat in the size of 20×20 cm, and addition of floating mat planted with four plants of *I. pseudoacorus*. During the incubation of 7 days the removal percents of total-N were 66% in the microcosms with floating mat and 90% in those with floating island of *I. pseudoacorus*. The removal percents of total-P were 54% in the microcosms with floating mat and 61% in those with floating island. The daily removal rates of plants were decreased from 294 $\mu\text{g g}^{-1}$ DM day⁻¹ to -87 $\mu\text{g g}^{-1}$ DM day⁻¹ for total-N and from 4.0 $\mu\text{g g}^{-1}$ DM day⁻¹ to -0.4 $\mu\text{g g}^{-1}$ DM day⁻¹ for total-P during the incubation. Our results showed that the artificial floating islands could be applied as a useful eco-technique to restore water quality of aquatic ecosystems such as ponds, lakes, and reservoirs.

B539 Plant Community and Restoration of Nanjido, a Representative Nonsanitary Landfill in South Korea

KeeDae Kim¹, Eun Ju Lee¹ and Kang-Hyun Cho²

¹School of Biological Sciences, Seoul National University; ²Department of Biological Sciences, Inha University

Vegetation and soil analysis of Nanjido, a representative nonsanitary landfill in South Korea were conducted to investigate the colonization status of plant community and to suggest restoration alternatives by comparing it with near by forest control sites. The vegetation of Nanjido was surveyed by quadrat method (size: 10×10 m²) and sand, silt, clay, pH, electric conductivity, organic matter, total-N, P, K, Ca, and Mg of soils were quantitatively analyzed. The coverage of all recorded species were ordinated by soil chemical variables through CCA(Canonical Correspondence Analysis). Commonly found tree species(appeared in all quadrats of Nanjido landfill) were *Salix babylonica*, *Platanus orientalis*, *Rosa multiflora*, *Prunus*

persica, *Albizia julibrissin*, *Indigofera pseudo-tinctoria*, *Robinia pseudo-acacia*, *Amorpha fruticosa*, *Ailanthus altissima*, *Forsythia koreana*, and *Paulownia tomentosa*. *Quercus mongolica* as a late successional species were recorded in Nanjido landfill. The amount of pH, electric conductivity, P, Ca, and Mg in soils of Nanjido landfill was significantly greater than that in soils of control sites ($P < 0.05$). In CCA ordination space, Nanjido sites were clustered in less acidic soils rich in Ca and Mg contents while control sites in acidic soils in poor in P contents. therefore, the study results shows that landfill sites are changed to a stable late succession stage if soil chemical contents of landfill sites transformed into that of control sites.

B540 Studies on Effect of Topographical Features on Distribution and Structure of Vegetation in Korean Peninsula

Keum-Chul Yang¹, Jae-Kuk Shim and Yang-Jai Yim

Department of Life Science, Chung-Ang University, Seoul 156-756, Korea

By using DEM and digital actual vegetation map with MGE GIS software program, this study aims to clarify quantitative characteristics of topography (altitude, aspect, slope, latitude etc.) and climatic factors (WI, CI, PE etc.), and their relationship with actual vegetation map in Korean Peninsula. And, their major results are as follows; Warmth Index decreases 5.27°C.month along latitudinal 1 degree increase, and 3.41°C.month along altitudinal 100meters. And then, climatic factors are characterized with WI of 37.0 ~ 121.0°C.month range, CI of -84 ~ 4°C.month range, PE of 459.2 ~ 820.0mm/yr range in S. Korea. The major forests are characterized with WI 43.0 ~ 108, 56 ~ 115, 72 ~ 121°C.month, CI -77 ~ -8, -64 ~ -1, -47 ~ 4°C.month, PE 697 ~ 764, 540 ~ 795, 606 ~ 819mm/yr, annual mean temperature 2.2 ~ 13.3, 4.3 ~ 14.5, 7.0 ~ 15.4°C range in *Abies koreana*, *Quercus variabilis*, *Pinus thunbergii* respectively.