

phylogenetic analysis of 16S ribosomal RNA gene nucleotide sequences. The isolates were found to fall within four major phylogenetic groups: the alpha-, beta-, and gamma-*Proteobacteria*; the low-G+C Gram-positive bacteria group. The alpha-group was further separated into three subclass, alpha-1, 2, and 4. Some of the isolates were not closely related to any genus in the 16S rDNA sequence databases. The genus *Sphingomonas* of alpha-4 subclass of the *Proteobacteria* was dominant group. The genus *Spingomonas* was yellow pigmented, motile rods and nonmotiles, gram-negative rods, 2-hydroxymyristic acid and isoprenoid quinone Q-10. Moreover, P5-21 and P5-11 strains within genus *Sphingomonas* appeared to be novel species, they will be discussed for new species in their taxonomic aspect.

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### Molecular Ecological Study on The Distribution of *Aeromonas* Species in Rainbow Trout Fish Farm

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*Aeromonas* species are mesophilic motile or psychrophilic nonmotile gram-negative bacteria. They are ubiquitous and widely isolated from clinical, environmental, and food samples. Although they have been recognized as primary fish pathogens, many studies have reported that they are potential human pathogens. As they are fish pathogens and found in aquatic environments, rainbow trout fish farm may be a potential *Aeromonas* reservoir. The present study describe the seasonal and spatial distribution of *Aeromonas* species in rainbow trout fish farm. In each season samples were taken from specific sites including inflow, farming area, lagoon, the

upper part of stream and the lower part of stream to join outflow and rainbow trouts. To characterize and to investigate the distribution of *Aeromonas* species, we used fatty acid methyl ester analysis to isolate *Aeromonas* species. The amplification of 16S rDNA and restriction fragment length polymorphism (RFLP) analysis were performed to isolates and samples without cultivation. In seasonal distribution, *Aeromonas* species except *A. salmonicida* showed seasonal differences. *Aeromonassalmonicida* was not detected in inflow but appeared in farming area and affected to lower part of stream showing little seasonal difference of distribution. *Aeromonas* species isolates from intestine of rainbow trout showed that most of them were *A. salmonicida*. From these results, it was supposed that rainbow trout acted as reservoir of *A. salmonicida* showing independent distribution in seasonal distribution and the distribution of other *Aeromonas* species was affected by temperature and precipitation in each season.

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### Characterization of the Cell Wall Lytic Enzyme of *Anabaena cylindrica* Produced by *Aspergillus sp.* HCLF-4

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In the mixed culture of *Anabaena cylindrica* and *Aspergillus sp.* HCLF-4, the algae was lysed in 5 days. And then, in the mixture of *Anabaena cylindrica* and extracellular enzyme when the HCLF-4 was grown in a PDB media which contained 0.05% heat killed *Micrococcus luteus* cells as substrate, it was observed segmented and lysed algae on microscopy. The lytic enzyme which molecular weight was about 14kDa, have

been detected in renaturing SDS-gel which contained 0.35% heat killed *Micrococcus luteus* cells as substrate. The lytic activity of the enzyme showed optimal condition of pH 3.0-4.0, and 30°C. The chemical ions such as magnesium and mangan ions displayed positive activity, but sodium, lithium, calcium, copper ions, EDTA, and PMSF appeared negative activity.

**B330****Silver Accumulation Bacteria Isolated from Groundwater**

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Silver accumulation bacteria were isolated 15 strains from 10 site of groundwater located in Seoul, Korea. Primary isolation were carried out in LB agar plate with 6mM AgNO<sub>3</sub> on top agar. These strains of bacteria were identified as *Bacillus cereus* and *Pseudomonas Fluorescens* by BIOLOG (Biotype G). Bacteria growth rate decreased by heavy metal as the concentration of silver was shown that growing pattern had longer lag adaptive phase in LB broth media which contained high concentration of AgNO<sub>3</sub>. Optimal pH value for the good viability of the isolated strain was 7.0 and also, temperature was 30°C. High resistance concentration showed 20ppm AgNO<sub>3</sub>. Until 20ppm of silver, this strain revealed that growth was continued. The largest accumulation of silver in the cell of *Bacillus cereus* and *Pseudomonas Fluorescens* occurred within 24 hours.

**B331****염류장애 토양에서의 염류가용화  
균주의 탐색**

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시설하우스 토양의 염류집적 장애를 극복하기 위하여 염류가용화 미생물을 탐색하고자 하였다. 충남지역내에서 타 지역보다 염류장애가 심한 당진군 일원의 시설하우스 토양에 대한 염류장애의 지표인 전기전도도를 측정할 결과 유곡리 > 자개리 > 술항리 > 금천리의 순으로 나타났으며, 또한 미생물 군집밀도와 NaCl 농도별 군집도 유곡리 지역이 가장 높았다. 각각의 토양으로부터 과잉의 인화합물을 제거할 수 있는 균주를 탐색하고자 불용성 인산염인 tricalcium phosphate가 첨가된 배지에 적용한 결과 16균주를 선별하였으며, 이들 균주들에 대하여 염류제거능을 조사하기 위하여 토양추출액에 균주를 접종하여 시기별로 전기전도도를 측정하여 염류가용화능이 우수한 KSJ 3, KSJ 8, KSH 11 및 KSJ 16 균주를 확보하였다. 이들 균주들은 토양내의 염류장애를 극복할 수 있는 능력이 탁월한 것으로 사료된다.

**B332****환경친화형 생물농약 개발 및 상품화**

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전국 각지에서 3년간 수백 개의 시료(흙)를 채취, 각종 세균 12만개를 분리한 후, 다양한 방법으로 항진균활성을 측정, 농작물 병원성 진균과 사람의 병원성 진균에 대해 우수한 항진균 활성을 나타내는 미생물들을 새롭게 분리, 탐색하였으며 독특한 형태의 제제화 기법을 이용하여 환경친화형 다기능적 미생물살균제 원제(농약원제)를 개발하였고, 원제를 이용하여 수화제, 입제 그리고 코팅입제 형태의 생물농약을 개발, 상품화하는데 성공하였다. 본 연구에서 개발된 무독성 생물농약(KL1114MBF)은 식물에 해가되는 유기물을 분해하여 식물의 생육을 도와줄 뿐만 아니라 동물실험(쥐)결과 오히려 활동력이 왕성해지는 등 해가 전혀 없는 것으로 나타났으며 원제 및