

simultaneous inoculation of root pathogen resulted in resistance to infection by root pathogenic fungus *F. oxysporum* as compared with control seedlings. The survival rate of the seedlings inoculated with *F. oxysporum*, and subsequently with ECM fungi was averaged by 52%, but pre- or simultaneous inoculation of ECM fungi completely protected *P. densiflora* seedlings against root infection by *F. oxysporum*. Disease suppression by ECM fungi in *P. densiflora* is, therefore, associated with an increase of fungitoxic or fungistatic metabolites excreted by symbiotic ECM fungi to the rhizosphere of seedlings.

D-40 Selection of effective nutrient sources for mass culture of the biocontrol bacteria *Bacillus amyloliquefaciens* A-2. Han Woo Kim, Ok Ju Chun, Kwang Youll Lee, Hyun Ki Kong, Soon Je Jung, Seon Woo Lee and Byung Ju Moon. Dong-A University, 840 Hadan2-dong, Saha-gu, Busan, Korea

Bacillus amyloliquefaciens A-2 strain exhibited the remarkable disease control value against the tomato leaf mold disease caused by *Fulvia fulva*. The optimal temperature of the bacterial growth was 30~35°C when cultured in nutrient broth. For the mass production of the biocontrol bacteria A-2, various carbon sources were amended and tested in a basal medium. It appeared that supplement of rice oil in a fermentation medium produced the highest cell density. Therefore, basal medium with 3% of rice oil (named as rice oil medium) was finally selected as a optimal medium for the mass production of biocontrol strain *B. amyloliquefaciens* A-2.

D-41 Screening and Characterization of Plant Growth Promoting *Pseudomonas* spp. for Biological Control of Damping off of Pepper caused by *R. solani*. M. Rajkumar¹, H. M. Kim¹, K. J. Lee¹, W. H. Lee¹, J. H. Kim² and B. T. Oh³. ¹Division of Biological Resources Science, Chonbuk National University, Jeonju 561-756, Korea ²Jeollabuk-do Agricultural Research and Extension Services, Iksan 570-704, Korea ³Department of Environmental System Engineering, Hallym University, Chuncheon 200-702, Korea

Fluorescent pseudomonads isolated from the rhizosphere of red pepper were screened for their ability to control the damping off of pepper caused by *R. solani*. Among a collection of pseudomonads, 13 isolates showed an inhibition of mycelial growth of *R. solani* in *in vitro* duel culture assay and some isolates increasing the growth of pepper in roll towel assay. Further, these 13 isolates were screened for the

reduction of disease severity caused by *R. solani* in *in vitro* seedling assay. Most of the antagonists showed varying levels of antagonism against *R. solani*. In addition, few isolates increased the root and shoot length of pepper. From these assay, five isolates were selected for *in vivo* biocontrol studies. Among them, isolates RD4 and SE2 showing highest ability to reduce the disease severity in the *in vitro* seedling assay was found to be the most efficient antagonists against *R. solani* in the *in vivo* biocontrol tests. Further, the relationship between the plant growth promoting/antagonistic potential of the fluorescent pseudomonads and its level of the production of auxiliary activities (siderophore, HCN, β -1,3-glucanase, chitinases, IAA production and phosphate solubilization) were studied.

D-42 Efficacy of A Biological Control Agent, *Bacillus subtilis* Strain BAC03-1 on *Pyricularia grisea*. Yeon Kyu Hong¹, Young Ki Lee², Bong Choon Lee¹, Seok Bo Song¹ and Sung Tae Park¹ ¹Yeongnam Agricultural Research Institute of NICS, RDA, Milyang 627-803, Korea ²National Institute of Agricultural Science and Technology, RDA, 441-707, Korea

A *B. subtilis* strain BAC03-1 in rice has isolated and identified and cultivated antagonistic strains of *Bacillus subtilis* from rice seeds. The disruption of the fungal spores and hypha exposed to the active substances was clearly observed. The MIC on growths of *Pyricularia grisea* was obtained. The ability of *B. subtilis* BAC03-1 to inhibit the fungal diseases in rice; *Pyricularia grisea* was tested *in vitro*. Having cultured both for 48 hours, there was a clear zone between *B. subtilis* strain BAC03-1 and both fungi. The optimal growth conditions in various culture media were investigated. The effectiveness of the antagonists were tested at green house and small field levels. The significant differences of the finding in relative lesion number, size and disease leaf area between the bacilli-treated and disease-control plants were demonstrated.. Keywords: Biological control, *Bacillus subtilis*, rice, *Pyricularia grisea*

D-43 *Bacillus subtilis* Strain BAC03-1 as an Antibiotic Effect on Bacterial Grain Rot of *O. sativa*, *Burkholderia glumae*. Yeon Kyu Hong¹, Young Ki Lee², Bong Choon Lee¹, Jae Bok Hwang¹ and Sung Tae Park¹ ¹Yeongnam Agricultural Research Institute of NICS, RDA, Milyang 627-803, Korea ²National Institute of Agricultural Science and Technology, RDA, 441-707, Korea

Bacillus subtilis Strain BAC03-1 was used for demonstration on antagonistic