

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,  $\beta$ -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 Hong<sup>1</sup>, Young Ki Lee<sup>2</sup>, Bong Choon Lee<sup>1</sup>, Seok Bo Song<sup>1</sup> and Sung Tae Park<sup>1</sup> <sup>1</sup>Yeongnam Agricultural Research Institute of NICS, RDA, Milyang 627-803, Korea <sup>2</sup>National 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 Hong<sup>1</sup>, Young Ki Lee<sup>2</sup>, Bong Choon Lee<sup>1</sup>, Jae Bok Hwang<sup>1</sup> and Sung Tae Park<sup>1</sup> <sup>1</sup>Yeongnam Agricultural Research Institute of NICS, RDA, Milyang 627-803, Korea <sup>2</sup>National Institute of Agricultural Science and Technology, RDA, 441-707, Korea

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

activity against bacterial grain rot which generate major diseases of rice. It is found that antagonist BAC03-1 having an advantage to impede the growth of *Burkholderia glumae*. Yet such an outcome derives from *B. subtilis* BAC03-1 producing antibiotics to the great extent when was grown in dextrose+1% potato broth medium. MIC and MBC of the *B. subtilis* BAC03-1 culture filtrate against *B. glumae* were 1 : 8 and 1 : 4, respectively. Results from the greenhouse trial using the three varieties showed very low rice blast severity with the inducer concentration of 10<sup>8</sup> cfu level. Highest protection against the rice grain rot pathogen when applied at the time of heading. *B. subtilis* BAC03-1 produced antibiotic substances as a water-soluble material, discharging in culture medium. Maximum inhibition apparently demonstrated following the growth of culture in PDB medium for 5 days. Keywords: Antibiotic effect, *Bacillus subtilis* strain BAC03-1, rice, *Burkholderia glumae*

**D-44 *Bacillus subtilis* Strain BAC03-1 as an Antibiotic Effect on Bacterial wilt of *Capsicum annum*, *Ralstonia solanacearum*.** Yeon Kyu Hong<sup>1</sup>, Young Ki Lee<sup>2</sup>, Bong Choon Lee<sup>1</sup>, Seok Bo Song<sup>1</sup>, and1 Sung Tae Park<sup>1</sup> <sup>1</sup>Yeongnam Agricultural Research Institute of NICS, RDA, Milyang 627-803, Korea <sup>2</sup>National Institute of Agricultural Science and Technology, RDA, 441-707, Korea

*Bacillus subtilis* Strain BAC03-1 was used for demonstration on antagonistic activity against bacterial wilt of which generate major diseases of *Capsicum annum*. On the growth control of *Ralstonia solanacearum* causing bacterial wilt in red pepper was conducted, using the antagonist *B. subtilis* strain BAC03-1. It is found that antagonist BAC03-1 having an advantage to impede the growth of *Ralstonia solanacearum*. The strain BAC03-1 gave the best relative protection (62%) against root and stem infections, when applied prior to and after inoculation with the pathogen. The highest shoot protection level (95%) was obtained when the bacterial antagonist was applied as a suspension from lyophilized cells. Yet such an outcome derives from *B. subtilis* BAC03-1 producing antibiotics to the great extent when was grown in dextrose+1% potato broth medium. Results from the greenhouse trial using the three varieties showed very low bacterial wilt severity with the inducer concentration of 10<sup>8</sup> cfu level. Keywords: Antibiotic effect, <>strain BAC03-1, *Capsicum annum*, *Ralstonia solanacearum*