

Trichoderma isolates, while Pseudomonas strains, B605, B634-2 and B724 effectively suppressed the disease showing 68% to 93% control value. Biospectrum and optimal delivery system of the promising biocontrol agents are being studied to pave safe production of organic leafy vegetables.

**D-58 Antifungal Activity of Two Essential Oils against *Botrytis cinerea*.** Chang-Hoon Kim, Mi-Jo Kwon, Hyo-Hyun Kim, Jae-Sung Park. Affiliated Research Institute Bicosys Co., Ltd.

Essential oils isolated from two plants viz. *Origanum vulgare L.* and *Thymus vulgaris L.* have been tested against fungi viz. *Botrytis cinerea*. Two essential oils of origanum and thyme showed high antifungal activity against *B. cinerea*. Two essential oils showed antifungal activity with minimum inhibitory concentration(MIC), ranging from 50 to 200ppm. The inhibition of *B. cinerea* was 100% for both oils at 200ppm, whereas the effects of the mixed origanum and thyme showed additive and low synergistic effect. The growth inhibition percentages of essential oils were measured as morphological abnormalities for *B. cinerea* involving lysis, distortion and swelling in hyphae, and also the screening was carried out using plant oil concentration for the determination of antifungal effects on the spore germination of *B. cinerea*.

**D-59 Biological Control of Lettuce *Sclerotinia* rot against *Sclerotinia sclerotiorum* by two strains of *Bacillus subtilis*.** Sang-Yeob Lee<sup>1</sup>, Wan-Gyu Kim<sup>2</sup>, Weon Hang Yeon<sup>2</sup>, Kyung-Seok Park<sup>1</sup>, Jong-Young Park<sup>1</sup> and Na Hyun Ryu<sup>1</sup> <sup>1</sup>Plant Pathology Division, National Institute of Agricultural Science and Technology, Suwon 441-707, Korea. <sup>2</sup>Applied Microbiology Division, National Institute of Agricultural Science and Technology, Suwon 441-707, Korea

Two strains of rhizobacteria, M27 and RM43 obtained from rhizosphere of lettuce plants showed antifungal activity against *sclerotinia* rot of lettuce caused by *Sclerotinia sclerotiorum*. Both isolates of M27 and RM43 were identified as *Bacillus subtilis* that based on fatty acid analysis of cell component by MIDI Shorlock and rDNA patterns respectively. Percentage of *Sclerotinia* rot on lettuce plants by two strains of M27 and RM43 were 14.0 and 26.0 respectively, compared to 42.0% for the control when applied soil drenched on lettuce plants in greenhouse test. On the other hand, two strains of M27 and RM43 were soil drenched on lettuce plants showed 34.0% and 36% respectively against *Sclerotinia* minor, compared to 98.0% for the control. In future studies, Antifungal substance has to be identified and further researches on mechanisms of antibiosis by the two strains are required.