antagonistic bacteria. At pots test, the control value of A-7 strain showed the highest value as 85% which was more effective than that of others in a growth chamber. For the promotion of control effect, the selected 3 isolates were spayed on the lettuce leaves as a sole and/or mixed treatments in a growth chamber, the mixed treatment of A-7 and RH-4 strain showing the control value of 90% was most effective than that of sole treatment with A-7 or RH-4 strain showing the control value of 80%, respectively and mixed treatment with A-2 and A-7 strain and A-2, A-7 and RH-4 strain. In addition, 3 bacteria re-isolated from diseased soils, and all of the selected 6 isolates investigated the control effect at pots in a growth chamber, According to the results, A-7 and Pro-EB 15 strain showed the control value of 91.0% and 90.1% respectively, and they were selected most effectual antagonistic bacteria to control lettuce sclerotinia rot and identified as the *Bacillus mojanvinensis* by 16s RNA analysis. This is the first report on the biological control using by *B. mojanvinensis* to the lettuce Sclerotinia rot.

2-34. Control Effect of *Stenotrophomonas maltophilia* BW-13 strain to the lettuce Bottom rot

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An antagonistic bacteria, *Stenotrophomonas maltophilia* BW-13 strain which was effectively inhibited mycerial growth of Bottom rot pathogen, *Rhizoctonia solani* PY-1 strain was isolated from the rhizosphere of the lettuce in Uiryeong-Gun, Gyeongsangnam-Do from 2002 to 2003. For the biological control, the most suitable inoculum and its density of pathogen, PY-1 strain ware tested prior biological control test, For the pathogenicity test, A inoculum (wheat bran+sawdust+rice bran+PDB) showing disease incidence of 100% was selected as the most suitable inoculum, which showed more effective than B inoculum (sawdust+rice bran+DW) and mycerial disc. also, In selection of the amount of inoculum (40g, 50g, 60g, 70g, 80g), most suitable amount of inoculum of pathogen determined as 40g showing disease incidence of 80%. For the selection of effective microorganism to control bottom rot on lettuce, about 200 isolates were isolated from the diseased soil and lettuce leaves, and examined their antifungal activity to the pathogen on PDA. As the pots assay, BW-13 strain showed the highest control value as 90%, and followed by R-13 and R-26 strain as 80% and 60%, respectively. Selected BW-13 isolates identified as *S. maltophilia* (GeneBank accession no. AJ293473.1, 99%) by 16S rRNA sequencing. This is the first report on the biological control using by *S. maltophilia* to the bottom rot pathogen, *Rhizoctonia solani* PY-1 strain.

2-35. Screening rhizobacteria for biological control of root rot and Phytophthora blight on ginseng.

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Ginseng (*Panax ginseng*) is one of the most widely cultivated medicinal herbs in Korea.

During 3 or 5 years cultivation of ginseng, yield losses can reach as high as 30-60% due to numerous diseases in Korea. Among 106 *Bacillus* strains isolated from various plant internal roots, we selected three promising biocontrol agents by screening against root rot caused by *Cylindrocarpon destructans* in a greenhouse. Preinoculation of selected isolates to seed or one-year-old root resulted in stimulation of shoot and/or root growth of seedlings, and control of root rot in infested soils with *Cylindrocarpon destructans* (P=0.05). Furthermore, drenching of selected isolates on seedling-growing pots reduced the incidence of Phytophthora blight when the seedlings were challenged with zoospores of *Phytophthora cactorum* (P=0.05). However, isolates B1141 and B1142 did not show any antifungal activity against various soilborne pathogens while B1146 did in vitro. Our results provide an insight that rhizobacteria can induce resistance against various plant diseases on ginseng even if any resistant breeds have been unknown on ginseng yet.

2-36. Postharvest biological control of garlic blue mold rot caused by *Pantoea agglomereans* and its mode of action

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To screen for potential biocontrol agents against postharvest disease of garlics caused by *Penicillium hirsutum*, a total of 933 isolates (432 fungi and 501 bacteria) were isolated from the rhizoshere or rhizoplane of garlics. Among them, *Pantoea agglomerans* isolate 59-4 (Pa 59-4) was selected for a potential biocontrol agent by in vivo wounded garlic bulb assay. When the spore suspension (10^5 spores/㎖) of *Penicillium hirsutum* was co-inoculated with spore or cell suspension of each fungal or bacterial isolate on wounded garlics, the isolate highly suppressed disease development. Soaking garlic bulbs in the suspension of Pa 59-4 significantly reduced garlic decay from *P. hirsutum*. However, Pa 59-4 did not inhibit the mycelial growth of *P. hirsutum* in dual-culture with *P. hirsutum* on Tryptic soy agar. In order to elucidate mode of action of Pa 59-4 nutrient competition between Pa 59-4 and *P. hirsutum* was investigated using tissue culture plates with cylinder inserts containing defusing membrane reported by Janisiewicz et al. The results showed that Pa 59-4 effectively suppressed spore germination and mycelial growth of blue mold in the low concentration (0.5%) of garlic juice, but did not suppress those of blue mold in the higher concentration (5%) of garlic juice. This result suggests that the mechanism in biocontrol of garlic blue mold by Pa 59-4 may involve in nutrient competition with *P. hirsutum* on garlic bulbs.

2-37 Biocontrol of gray mold of cucumber and tomato by epihpytic bacteria in field condition

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Bacterial isolates, CC178, PTC25, HC39 and KY165 originally obtained from the leaves of