Pre-treatment of albino strain of *Ophiostoma quercus* on pine wood had been proven to be effective in both laboratory and field trials for the biocontrol of sapstain of wood caused by ophiostomatoid fungi (*The Plant Pathology Journal* 2000. 16(4):200-205). In order to keep viability and activity of the biocontrol agent, mycelial slurry from liquid culture of albino strain was harvested, freeze-dried, and then the powderized mycelium was vacuum-packed in polystyrene tubes with screw cap, stored at a cryotank with liquid nitrogen, refrigerator, and root temperature. Viability and efficacy after long term storage under different conditions were estimated and compared by plating diluted suspension(10^{-3}) with sterilized water on solidified culture medium and spraying directly on sterilized wood chips of *Pinus densiflora* and *P. rigida* in petri dishes, respectively. Mycelial growth of albino strain was also compared in various liquid culture media, and the medium composed of the mixture of brown sugar(30%) and yeast extract(3%) showed the best growth among compared.

D-53 Inhibition of mycelial growth of *Botrytis cinerea* by various essential oils. NG Kim, SW Kang, MH Nam, SJ Yoo, HG Kim. Dept. of Agricultural Biology, Chungnam National University, Daejeon, 305-764, Korea;

As nontoxic environmental-friendly bio-fungicides, several essential oils were tested for antifungal activity against *Botrytis cinerea*, gray mold pathogen of strawberry. *In vitro* bioassay, carvacrol, thymol, eugenol and methyl eugenol were selected and the inhibition rate of the mycelial growth on PDA containing each essential oil was achieved at 100ppm with 82.9%, 94.8%, 76.7% and 43.3%, respectively. In the test for volatile effect, carvacrol, thymol and eugenol showed the inhibition rate of 55%, 52%, 34%, respectively in 4 cm distance and methyl eugenol was ineffective with 15%, at 500μg/disk. Under microscopic observation, cytoplasmic outflow of cell wall from mycelia was shown by treatment of eugenol and methyl eugenol, while carvacrol and thymol showed little cytoplasmic outflow and more inhibition of mycelial growth. *In vivo* test, each essential oil had high level of disease suppression with thymol 41.7%, eugenol 33.3% and methyl eugenol 90.7% at 100ppm concentration after treated 3 times every one week. This result presents that the essential oils should be utilized for environmental-friendly cultivation as a bio-fungicide against *Botrytis cinerea*.

D-54 Antifungal activity of asarone against *Botrytis cinerea* isolated from *Acorus gramineus*. NG Kim, JB Kim, HG Kim. Dept. of Agricultural Biology, Chungnam National University, Daejeon, 305-764, Korea

We found the antifungal activity of MeOH extract from *Acorus gramineus* rhizome against *Botrytis cinerea*. The MeOH extract of *Acorus gramineus* rhizome was partitioned *n*-Hexane, Chloroform, Ethylacetate, *n*-Butanol one by one. In order to isolate the antifungal substance, *n*-Butanol fraction was purified by preparative silica gel open column and sephadex LH-20 column chromatography. In ODS thin layer chromatography and LC-mass analysis, antifungal substance was identified to be asarone. *In vitro* assay, the inhibition rate of the mycelial growth on PDA containing asarone was achieved 70% at 100㎍/㎖ concentration, while the antifungal activity was little even 1mg/disk concentration on agar diffusion method. These contrastive results showed that asarone has antifungal activity in case of direct contact only, unlike other volatile essential oils.

D-55 Evidence for plant growth promotion by fungal volatiles from a strain of PGPF, *Cladosporium* sp. CL1 on tobacco plant. Kyungseok Park and Eun-Young Kim. Biological Control Lab., Division of Plant Pathology, National Institute of Agricultural Science and Technology, Suwon 441-707 Korea

A large number of fungal volatiles have been reported as fungal metabolites in cereal grains in plants because fungal growth in cereals decreases their nutritional value and can pose health hazards. In recent research in other microbially produced volatiles exhibit an unpleasant odor and might be harmful in public health. Here, A strain of plant growth-promoting fungi was isolated from rhizosphere of wild plants showed plant growth promotion and induce systemic resistance on tobacco plants. The result of I Plate assay, tobacco plants showed significant plant growth promotion by unknown volatiles of a plant growth promoting-fungi, *Cladosporium* sp. CL1. Recently, C.M. Ryu et al convincingly demonstrated that airborne volatiles from growth-promoting strains could stimulate the growth of Arabidopsis plants. The related compound from culture filtrates were identified as 2,3-butandiol and acetoin. But still did not report the evidence for volatile which related plant growth promotion in PGPF strains. We provide the evidence that the plant growth of tobacco plants activated by volatiles from *Cladosporium* sp. CL1. Furthermore, when the isolate inoculated on the roots of tobacco, plant showed induces systemic resistance against *Erwinia carotovora* SCC1. The results suggest that volatiles from a strain of CL1 involve plant growth promotion as well as induce systemic resistance.