

Natsuda Kumyod 2014: Efficacy of Antagonistic Bacteria for the Control of Damping-off of Cucumber Seedlings Caused by *Pythium aphanidermatum*. Master of Science (Plant Health), Major Field: Plant Health, Department of Plant Pathology. Thesis Advisor: Assistant Professor Wanwilai Intanoo, Ph.D. 74 pages.

Total of 112 isolates of bacteria were isolated from root zone soil (56 isolates), and leaves (56 isolates) of cucumber at Kamphaeng Sean District in Nakhon Pathom. Province by serial dilution on four media, including nutrient glucose agar (NGA), King's medium B (KB), Thornston's medium and yeast extract-malt extract agar (YM). The isolated bacteria were evaluated by dual culture test on potato dextrose agar (PDA) medium for the efficacy to inhibit mycelial growth of *Pythium aphanidermatum*, the causal agent of damping-off of cucumber seedling. Results showed that 13 isolates of bacteria effectively inhibited mycelial growth of *P. aphanidermatum* by 13.75-55.28%. Selected bacteria were further tested for the efficacy to control damping-off of cucumber seedlings under greenhouse condition by soaking seeds in bacterial cell suspension (10^8 cfu/ml) for 15 minutes before sowing in the pathogen infested soil. The results indicated that isolate SDN-23 was the most promising isolate which provided the highest percentage (86.67%) of survived seedlings after planting for 14 days. The efficacy of isolate SDN-23 was higher than the control (with pathogen) and seeds treated with metalaxyl 35 SD. The efficacy of antagonistic isolates SDN-9 and SDN-23 to provide the germination percentages of 7-day-old seedlings and survived seedlings after planting for 14 days were comparable to the use of metalaxyl 35 SD. These isolates also reduced populations of *P. aphanidermatum* in cucumber planting soil at 14 days after planting. Two selected isolates were developed as 10 ppm rifampicin antibiotic resistant markers. Results showed that M3-SDN-9 and M5-SDN-23 effectively to inhibited mycelial growth of *P. aphanidermatum*. They were developed as soil formulation for further testing under field condition. The isolate M3-SDN-9 and M5-SDN-23 increased the survived seedlings after planting for 14 days and reduced the percentages of post-emergence damping-off after planting for 28 days. Their efficacies were comparable to the use of *Trichoderma harzianum* (CB-Pin-01). The percentages of root colonized with *P. aphanidermatum* were reduced. The efficacy of these antagonistic bacteria to provide cucumber yield weights were comparable to the use of *Trichoderma harzianum* (CB-Pin-01).

Student's signature

Thesis Advisor's signature