Walailak Sontawin 2014: Efficacy of Antagonistic Bacteria for the Control of Fusarium Wilt of Cucumber Caused by *Fusarium oxysporum* f.sp. *cucumerinum*. Master of Science (Plant Health),Major Field: Plant Health, Department of Plant Pathology. Thesis Advisor: Assistant ProfessorWanwilai Intanoo, Ph.D. 103 pages.

Total of 112 isolates of bacteria were isolated from root zone soil (56 isolates), and leaves (56 isolates) of cucumber at Kamphaeng Saen District in Nakhon Pathom Province by serial dilution on four media, including nutrient glucose agar (NGA), King's medium B (KB) and Thornston's medium. The isolated bacteria were evaluated by dual culture test on potato dextrose agar (PDA) medium for the efficacy to inhibit mycelial growth of Fusarium oxysporum f.sp. cucumerinum (FOC), a causal agent of cucumber wilt. Results showed that 19 isolates of bacteria effectively inhibited mycelial growth of FOC by 38.33 - 50.21% as compared to the control. Selected bacteria were further tested for the efficacy to control under screenhouse condition by soaking seeds in bacterial cell suspension (10<sup>8</sup> CFU/ml) for15 minutes before sowing in the pathogen infested soil. The results indicated that germination percentages of 7-day-old seedlings in all bacterial traeatments were not different to the use of carbendazim 50 WP (20g/20ml), except two treatments using bacteria isolates SDN-37 and LBN2-1. Bacterial isolate LBN1-5 was the most promising isolate to provide the highest percentage of survived seedlings (40 %) after planting for 14 days, which was comparable to the seeds treated with carbendazim. This bacterial isolate also promoted the longest root length of 14-dayold seedlings (18.83 cm.), which was higher than the other treatments and the control (with pathogen) by 20.01 and 41.26 %, while carbendazim provided the increased of root lengths by 10.65%. The bacteria isolate SDN-9 reduced the percentages of root colonized with pathogen, which was comparable to the seeds treated with carbendazim. Bacteria isolates were developed for resistant to rifampicin antibiotic, with the efficacy to inhibit mycelial growth of the pathogen were isolates M3-SDN-9, M5-SDN-23 and M5-LBN 1-5. All there isolates were developed as soil powder formulations and then were used for the efficacy test to control cucumber wilt under field condition. Results showed that three bacterial treatments provide significant higher germination percentage of 7-day-old seedlings and survived seedlings at 14, 21 and 28 days after planting than the seeds treated with carbendazim. Isolate M5-LBN 1-5 gave the highest percentages of germination and survived seedlings, the lowest percentages of disease incidence and disease index 32.69 and 29.37 % than the control reduced the percentages of root colonized and increased yield as compared to the carbendazim treated control

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Student's signature

Thesis Advisor's signature