

Jittraya Jarujit 2009: Control of Bacterial Wilt of Tomato by Plant Extracts and Silicon Applications in Greenhouse. Master of Science (Agriculture), Major Field: Plant Pathology, Department of Plant Pathology. Thesis Advisor: Associate Professor Niphone Thaveechai, Ph.D. 100 pages.

Nine plant extracts from Betel (*Piper betle*, Pb) Eucalyptus (*Eucalyptus camaldulensis*, Ec) Artabotrys (*Artabotrys hexapetalus*, Ah) Cha-plu (*Piper sarmentosum*, Ps) Mangosteen (*Garcinia mangostana*, Gm) Shiny leave (*Peperomia pellucida*, Pp) Chuang-Chia (*Zanthoxylum* sp., Za) Guava (*Psidium guajava*, Pg) and Neem (*Azadirachta indica*, Ai) were investigated for antimicrobial activity against *Ralstonia solanacearum* strain To-Ud3^{amp}(RS), causal agent of bacterial wilt of tomato by paper disc diffusion method. The most five plant extracts with high inhibition efficacy against RS were Guava, Eucalyptus, Betel, Chuang-Chia, and Artabotrys, respectively. The five plant extracts at 2-10% in Tetrazolium chloride broth at 24 hr incubation were significantly inhibited RS and inhibition activity was more increasing at 48 hr after incubation. Chuang-Chia extract at 1 ml in soil for 2 to 8 weeks showed the highest inhibition of RS in soil which was significantly different from others and non-treated control. Inhibition activity of RS of the five plant extracts were increased after increasing amount of plant extract and incubation time. Chuang-Chia extract at 4 ml after 6 weeks of incubation gave the best inhibition of RS which was no RS detected in soil. Both forms of silicon as salisic acid (Si1) and sodium silicate (Si2) were no inhibition against RS on culture media. Experiment on control bacterial wilt caused by RS on tomato cv. Seeda Thip 3 in commercial type greenhouse at Asian Institute of Technology, Pathumtani province found that both Si1 and Si2 treatments had the highest tomato survival at 78% and the highest yield at 150 g/plant which were significantly different from treated with either Chuang-Chia alone or combined with Chuang-Chia having tomato survival of 33% and yield at 50 g/plant and non-treated control containing tomato survival 11% and yield at 10 g/plant. Assaying rhizosphere population of RS had initial population at 8.87 Log CFU/ml and at eight weeks post inoculation, Si2 had the lowest RS population at 2.67 Log CFU/g of soil which was significantly different from the highest RS population at 2.75 Log CFU/g of soil of the control. Basic phytochemistry analysis of Chuang-Chia extract contained alkaloid active compound. Thin layer chromatography (TLC) separation of Chuang-Chia extract with solvent mixture of CHCl₃:MeOH at 7:3 and testing with Dragendorff's reagent found reaction of brown orange colour of alkaloid at R_f of 0.36 on TLC plate. This study is the first report of successful application of Chuang-Chia and silicon for controlling bacterial wilt of tomato caused by RS under commercial type greenhouse until harvesting yield.

Student's signature

Thesis Advisor's signature