7.18 P

Evaluation of antibiotics against the bacteria, *Candidatus* Liberibacter for control of citrus Huanglongbing

Zhang, M.[1,2,3], Guo, Y.[1], Powell, C.A.[1], and Duan, Y.[2]

[1]Indian River Research and Education Center, IFAS-UF, Fort Pierce, FL 34945,USA
[2]USDA-ARS, US Horticultural Lab, Fort Pierce, FL 34945,USA
[3]State Key Lab for Conservation and Utilization of Subtropical Agro-bioresources, Guangxi Univ.,Guangxi 530004, China

Citrus Huanglongbing (HLB) is one of the most serious diseases of citrus worldwide. The present study was undertaken to screen antibiotics against *Candidatus* Liberibacter asiaticus (Las) while simultaneously assessing phytotoxicity to citrus. Twenty-eight antibiotics from ten classes of medical-antibiotics and three agricultural-antibiotics were tested for *in vivo* activities against HLB bacterium using the previously optimized graft-based chemotherapy method (Zhang et al., 2012). First, samples for DNA extraction were taken at 4 months after inoculation; subsequent samplings were taken at 2 month intervals. The Las-infected plants were considered as Las positive by real-time qPCR with threshold cycle (Ct) values less than 32.0. The efficiency against the HLB bacterium of each compound was evaluated by Ct values in the inoculated plants (both scions and rootstocks), scion infected percentage and HLB bacterial transmission percentage. The phytotoxicity was determined by the survival and growth of scions treated by antibiotics. The results showed that beta-lactam antibiotics (Ampicillin, Pennicillin and Carbenicillin) were highly effective in eliminating the HLB bacteria, with undetectable Las titers in the inoculated plants by qPCR, and had no phytotoxicity to citrus, with more than 75% scion survival. Antibiotics sulfonamide and tetracycline suppressed the HLB bacterium with Ct values of 35.7 on average, less than 30% scion infection and 16.9% Las-transmission percentage. The effectiveness of some antibiotics, such as aminoglycoside and quinolone, depended on their absorptions and permeability throughout the citrus tree. Peptide antibiotics were not effective in eliminating or suppressing Las bacterium with less than 28.0 Ct values by qPCR and higher scion infection percentages and Las transmission rates. Three agric-antibiotics, Actidione, Validoxylamine A and Zhongsenmycin, were also effective in eliminating the HLB bacteria. Antibiotic combinations, such as beta-lactam and aminoglycoside, are suggested as future applications.