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## Journal of Citrus Pathology

### Title

Antimicrobial Compounds to Combat Citrus Huanglongbing

### Permalink

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### Journal

Journal of Citrus Pathology, 1(1)

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### Publication Date

2014

### DOI

10.5070/C411025126

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**Antimicrobial Compounds to Combat Citrus Huanglongbing**Zhang, M.<sup>1,2,3</sup>, Guo, Y.<sup>1</sup>, Powell, C.A.<sup>1</sup>, and Duan, Y.<sup>2</sup><sup>1</sup>Indian River Research and Education Center, IFAS-UF, Fort Pierce, FL 34945, USA<sup>2</sup>USDA-ARS, US Horticultural Lab, Fort Pierce, FL 34945, USA<sup>3</sup>State Key Lab for Conservation and Utilization of Subtropical Agro-bioresources, Guangxi Univ., Guangxi 530004

Citrus Huanglongbing (HLB) is associated with the fastidious bacterium, *Candidatus Liberibacter*, (Las) that is transmitted by a phloem-feeding insect (Citrus Psyllid). An ideal solution to combat citrus HLB is to completely eliminate the bacteria after a single course of the chemotherapy, either active directly on the bacteria or indirectly through induction of host defense compounds. Twenty-seven antimicrobial compounds were screened to test for *in vivo* activities against HLB bacterium while assessing their phytotoxicity to citrus using the optimized graft-based chemotherapy approach (Zhang et al., 2012). The Las bacterial titers were quantified by qPCR from the leaf samples that were taken at 4-months and 6-months after inoculation, respectively. The Las-infected plants were considered as Las positive with threshold cycle (Ct) values less than 32.0. The efficiency against the HLB bacterium of the tested 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 antimicrobial compounds. The clustering results indicated that 27 antimicrobial compounds were divided into 3 groups. The first group including 12 compounds, such as Zineb, was not effective in eliminating the HLB bacteria, with high scion infection ( $67.9\% \pm 14.4\%$  on average), Las transmission percentage ( $83.4\% \pm 13.85$  on average) as well as the high bacterial titers. The second group of only two compounds was also not effective against the HLB bacterium, but had high phytotoxicity to citrus (less than 40% of the scion survival and 15% of the scion growth). The third group including 13 compounds, such as nicotine, was effective in eliminating the Las bacteria and had no phytotoxicity to citrus. The effective compounds will be further tested in the container-potted plants and in the field.