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Authors
Ying, Xiaobao
Wang, Nian

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Characterization of putative virulent factors of *Candidatus* Liberibacter asiaticus

Ying, X. and Wang, N.

Citrus Research and Education Center, Department of Microbiology and Cell Science, University of Florida, 700 Experiment Station Road, Lake Alfred 33850, U.S.A.
Corresponding author: nianwang@ufl.edu

Citrus greening or huanglongbing (HLB) is a devastating disease of citrus, and poses a major threat to the citrus industry in the United States (1, 2). *Candidatus* Liberibacter asiaticus has been known to be associated with HLB in the United States (3, 4). Unsuccessful attempts to culture *Ca*. L. asiaticus have notably hampered efforts to understand its biology and pathogenesis mechanism despite some limited progresses in culturing. In order to characterize the putative virulence factors, we expressed putative virulent factors in *Nicotiana benthamiana*. Totally 24 putative virulent factors are being tested with most of them containing signal peptides. By transient expression of the candidates using TMV vector in *N. benthamiana*, we can screen the genes influencing plant development and morphology. Meanwhile, transformation of candidate genes into *N. benthamiana* driven by 35S promoter and phloem specific promoter respectively will further verify the function of putative virulence factors. Identification and characterization of the various virulence factors in *Ca*. L. asiaticus will advance the understanding of the biology and pathogenicity of the pathogen.

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