

9.8

‘*Candidatus Liberibacter asiaticus*’ Encodes Two Novel Autotransporters that Target to MitochondriaHao, G.¹, Boyle, M.², Zhou, L.¹, and Duan, Y.¹¹USDA-ARS-USHRL, Fort Pierce, Florida 34945²Smithsonian Marine Station, 701 Seaway Drive, Fort Pierce, FL 34949

As a phloem-limited, intracellular bacterial pathogen, ‘*Candidatus Liberibacter asiaticus*’ (Las) has a significantly reduced genome and causes huanglongbing (HLB), a devastating disease of citrus worldwide. In this study, we characterized two novel autotransporter proteins of Las, and redesignated them as LasA_I and LasA_{II} in lieu of the previous names Hyv_I and Hyv_{II}. Proteins secreted by the type V secretion system (T5SS), known as autotransporters, are large extracellular virulence proteins localized to the bacterial poles. Bioinformatic analyses revealed that LasA_I and LasA_{II} share the structural features of an autotransporter family containing large repeats of a passenger domain and a unique C-terminal translocator domain. When fused to the GFP gene and expressed in *E. coli*, the LasA_I C-terminus and the full length LasA_{II} were localized to the bacterial poles, similar to other members of autotransporter family. Despite the absence of the signal peptide, LasA_I was found to localize at the cell surface by immuno-dot blot using a monoclonal antibody against the partial LasA_I protein. Its surface localization was also confirmed by the removal of the LasA_I antigen using a proteinase K treatment of the intact bacterial cells. When co-inoculated with a P19 gene silencing suppressor and transiently expressed in tobacco leaves, the GFP-LasA_I translocator targeted to the mitochondria. This is the first report that Las encodes novel autotransporters that target to mitochondria. These findings may lead to a better understanding of the pathogenesis of this intracellular “energy parasitic” bacterium, and to more efficient characterizing new molecular targets for HLB control.