



Title:

Home Detection Kit for Candidatus *Liberibacter asiaticus* (LAS) Associated with Citrus Huanglongbing from Psyllids

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Abstract:

Management of citrus huanglongbing (HLB) requires rapid detection of infected psyllids and trees in an orchard. Detection of HLB associated bacteria (LAS) can be done using psyllids since detection in infected trees is usually delayed (Manjunath et al., 2008). We have developed an easy to use, rapid and affordable detection kit for grower use for testing psyllids for LAS at a reasonable price for initial investment and an operating cost of about \$2 per sample.. Eight psyllid samples can be simultaneously tested within 45 minutes. The psyllid DNA extraction and detection of LAS are conducted using a SmartDART™ unit which is operated by software installed on any android device for visualizing real time results. The test results can be e-mailed for both storage and analysis. The DNA prepared can be stored refrigerated and sent to a laboratory for validation. No other equipment (even pipets) is required for the test. The detection system was validated using a large number LAS isolates from many citrus varieties, from different countries; the results were comparable to that of traditional real time PCR data. Development of methods for multiplex detection of the pathogen and the host DNA from both psyllids and plant host are in progress. We believe the detection system will be useful for growers in intra-orchard management, for extension workers, nurserymen, and in areas where the disease has become endemic as well as in those areas where the disease has been recently introduced.

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Home Detection Kit for *Candidatus Liberibacter asiaticus* (LAS) Associated with Citrus Huanglongbing from Psyllids

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Management of citrus huanglongbing (HLB) requires rapid detection of infected psyllids and trees in an orchard. Detection of HLB associated bacteria (LAS) can be done using psyllids since detection in infected trees is usually delayed (Manjunath et al., 2008). We have developed an easy to use, rapid and affordable detection kit for grower use for testing psyllids for LAS at a reasonable price for initial investment and an operating cost of about \$2 per sample.. Eight psyllid samples can be simultaneously tested within 45 minutes. The psyllid DNA extraction and detection of LAS are conducted using a SmartDART™ unit which is operated by software installed on any android device for visualizing real time results. The test results can be e-mailed for both storage and analysis. The DNA prepared can be stored refrigerated and sent to a laboratory for validation. No other equipment (even pipets) is required for the test. The detection system was validated using a large number LAS isolates from many citrus varieties, from different countries; the results were comparable to that of traditional real time PCR data. Development of methods for multiplex detection of the pathogen and the host DNA from both psyllids and plant host are in progress. We believe the detection system will be useful for growers in intra-orchard management, for extension workers, nurserymen, and in areas where the disease has become endemic as well as in those areas where the disease has been recently introduced.

References

Manjunath K.L., Halbert, S.E., Ramadugu, C., Webb, S., and Lee, R. F. 2008. Detection of '*Candidatus Liberibacter asiaticus*' in *Diaphorina citri* and its importance in the management of citrus Huanglongbing in Florida. *Phytopathol.* 98(4): 387-396. (doi: 10.1094/PHYTO-98-4-0387)