5.8 Discovery of *Candidatus* Liberibacter psyllaurous and its insect vector the tomato psyllid (*Bactericera cockerelli*)

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A new *Candidatus* Liberibacter species infecting the psyllid *Bactericera cockerelli* and its solanaceous host plants potato and tomato was genetically and ecologically characterized (1). Phylogenetic analysis using the 16s rRNA sequence, places the new bacterium within the genus *Candidatus* Liberibacter, and it is designated as “*Candidatus* Liberibacter psyllaurous” (1). Based on *Ca. L. psyllaurous*’s 16s rRNA, intergenic spacer region (ISR), and 23s rRNA gene regions the same strain of *Ca. L. psyllaurous* was found in psyllid populations from Texas and California, and in psyllid-*Ca. L. psyllaurous* infected potato and tomato plants (1). The same strain was also found in New Zealand infecting *Solanum lycopersicum*, based on the 16s rRNA and ISR (2). Using PCR detection of *Ca. L. psyllaurous*, bacterial infection frequencies of psyllids are variable between psyllid life stages and the host plants potato and tomato. In addition, the bacterium is vertically as well as horizontally transmitted (1). Higher infection frequencies are found in eggs, 1st, and 2nd instar nymphs isolated from potato host plants relative to nymphs isolated from tomato host plants (1). One explanation for lower efficacy rates of transovarial transmission and lower rates of horizontal transmission on tomato plants relative to potato plants is that there is a higher titer of the bacterium in potato relative to tomato host plants. Transovarial transmission has also been found in the psyllid *Trioza erytreae* infected with an unspecified “greening disease agent”, which was associated with Huanglongbing (a.k.a. citrus greening disease), on sweet orange in South Africa (3).

In vector-transmission trials potato plants and tomato plants inoculated with infected psyllids were positive for *Ca. L. psyllaurous* infection and showed signs of yellowing, whereas control plants were negative for the bacterium and showed no signs of yellowing (1). Consequently it is highly likely that the symptoms described as psyllid yellows on potato and tomato are caused by this bacterium. All three known citrus Liberibacter species are associated with necrosis of plant phloem tissue and subsequent yellowing of leaves (4). Necrosis of phloem has also been observed in “psyllid yellow” diseased potato relative to healthy potato plants (5). Implications of these finding for disease management of potato and tomato plants are substantial. More information is needed from natural psyllid populations to determine how widespread *Ca. Liberibacter psyllaurous* infection is in *B. cockerelli*. The host plant range of *Ca. Liberibacter psyllaurous*, other than tomato and potato, is unknown at this time. Since this insect is polyphagous and has a very wide range of host plants, including many solanaceous plants as well as other plants outside the Solanaceae such as pine, spruce, and cedar (6), other economically and ecologically important plants may be exposed to this disease as well.

**Literature Cited**

Knowlton GF, Thomas WL. 1934. Host plants of the potato psyllid. J. Econ. Entomol. 27:547.