



## Metagenomic Insights into the *Empoasca fabae* Microbiome Reveal Candidates for Targeted Biocontrol

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- **Date and Time:** Wednesday, July 23, 2025, 15:00 CEST
- **Webinar Link:** Scan the QR to join the mailing list. The webinar link will be sent by email.

### Abstract

Synthetic pesticides remain central to pest control, but environmental concerns and resistance are driving the search for sustainable alternatives. Insect-associated microbiomes offer untapped potential for developing targeted biological control strategies. Here we investigated the microbiome of the potato leafhopper (*Empoasca fabae*), a major agricultural pest, using metagenomic sequencing of wild specimens from alfalfa fields in southern Québec. After removing host DNA, we assembled 34 metagenome-assembled genomes (MAGs), including 12 high-quality genomes. Key taxa included *Pseudomonas*, *Acinetobacter*, *Symbiopectobacterium*, and several Enterobacteriaceae (*Pantoea*, *Kosakonia*, *Enterobacter*). Functional annotation revealed biosynthetic gene clusters (BGCs) linked to antimicrobial and signaling compounds, particularly in *Pseudomonas*. Enterobacteriaceae were enriched in pathways for sugar metabolism, possibly supporting insect nutrition. We also detected 17 prophages, primarily in Enterobacteriaceae, some with intact structural and regulatory genes, including CI repressors, indicative of active lysogenic cycles. These findings highlight microbial symbionts and phages as promising targets for biocontrol. By manipulating the leafhopper microbiome, disrupting key symbionts, enhancing antagonistic strains, or activating latent phages, it may be possible to reduce pest fitness or vector competence. This work sets the foundation for microbiome-based pest control approaches, contributing to more sustainable agriculture.

### Speaker Bio



Dr. Edel Pérez-López is an Associate Professor of Phytopathology at Université Laval. He completed his BSc in Biochemistry at Havana University, Cuba, and then earned a PhD from Universidad Veracruzana, Mexico. Following this, he undertook a postdoctoral fellowship at Auburn University, USA, and another at the University of Saskatchewan, Canada. Since joining Université Laval, the EdeLab, led by Dr. Pérez-López, has been investigating various plant pathogens and insect vectors. His lab has a special focus on effector biology as a means to develop long-lasting resistance in crops. They also study how climate change affects the distribution and incidence of emergent plant diseases and insect vectors.

