



Aquatic and alpine habitats as havens of emergent pathotypes of *Pseudomonas syringae*

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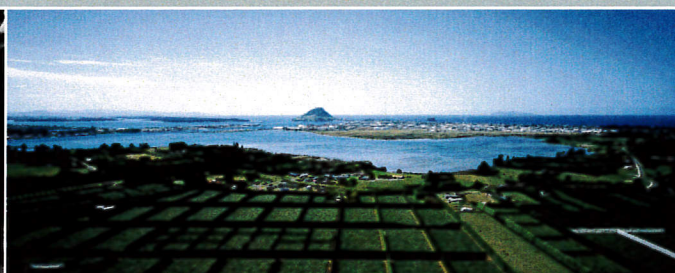
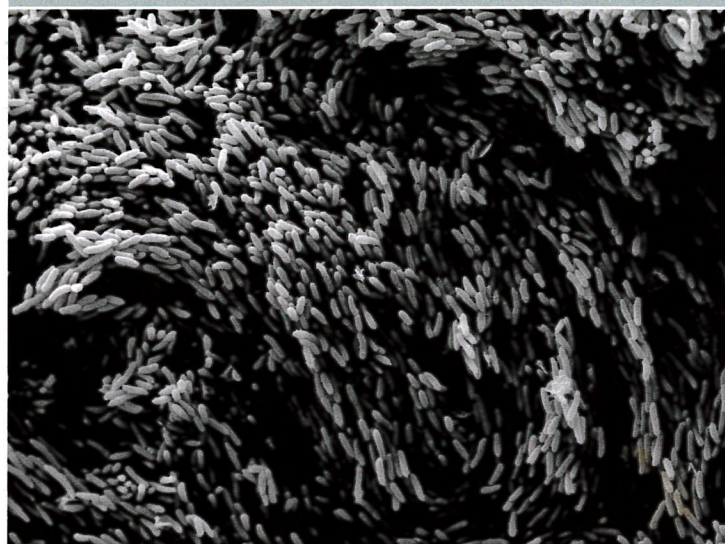
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ABSTRACT AND PROGRAMME BOOK



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Aquatic and alpine habitats as havens of emergent pathotypes of *Pseudomonas syringae*

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One of the fundamental questions in plant pathology concerns the origin of plant pathogens – where do new pathogens come from? For the past 60 years, the concept of gene-for-gene co-evolution of plants and pathogens has been the predominant framework for understanding the emergence of new plant pathogens. This concept describes a process of natural selection that leads to changes in population structure of the pathogen. However, a missing element in this concept of emergence is how the diversity - on which natural selection operates - arises. Random mutations, horizontal gene transfer, and recombination clearly mold the genomes of plant pathogens to various degrees. However, the relative importance of these processes for plant pathogens and where and when they occur are most often unknown. Recent advances in the understanding of the ecology and life history of *Pseudomonas syringae* have led to new insight into the origin of pathogens. Although *P. syringae* has been considered to be highly adapted to live in association with plants, it is now apparent that freshwater habitats harbor about half of the total metapopulation of this bacterium. Furthermore, the genetic diversity in aquatic and other non agricultural habitats of *P. syringae* largely surpasses that found in association with cultivated plants and with diseased plants in particular. Strains from these habitats have a wider diversity of combinations of alleles of effectors and seem to be subject to rates of recombination greater than what has been observed in strains from disease epidemics. The implication of these results for future emergences of new pathotypes of the kiwi canker pathogen will be discussed.

Notes

Keynote Speakers



Prof David Guttman

Centre for the Analysis of Genome Evolution & Function, Canada

Dr. Guttman received his Ph.D. in microbial evolutionary genetics from Stony Brook University in 1994, followed by postdocs in molecular evolution and molecular plant pathology at the University of Chicago. He started his faculty position at the University of Toronto in 2000, and is currently a Professor with joint appointments in the Departments of Cell & Systems Biology (CSB) and Ecology & Evolutionary Biology. He is also the Associate Chair for Research in CSB and founder and Director of the University of Toronto Centre for the Analysis of Genome Evolution & Function.

Dr. Guttman runs a highly diverse research program with three major foci: (1) the evolution of host specificity and virulence in plant pathogenic bacteria; (2) plant and microbial comparative genomics; and (3) studies of the human and plant-associated microbiome. He is best known for elucidating evolutionary and mechanistic processes that determine the course and fate of microbial infections, and characterizing the impact of natural genetic variation on the balance between disease and immunity. These studies have led to numerous awards and honors, including a Canada Research Chair in Comparative Genomics, the Chair of the American Society for Microbiology Division for Evolutionary and Genomic Microbiology, and membership on the editorial boards of prestigious journals such as PLoS Pathogens and PLoS Genetics.



Dr Cindy Morris

INRA, France

Cindy Morris is currently the Director of the Plant Pathology Research Unit at the center of the French National Agricultural Research Institute (INRA) in Avignon. After obtaining her PhD in 1985 from the University of Wisconsin-Madison, she spent four years as a postdoctoral researcher at Beijing Agricultural University (BAU) on a fellowship from the US National Academy of Sciences and with funding from BAU working on plant disease and post-harvest decay in multi-cropped vegetable production systems. Since 1989, her work at INRA in Avignon has focused on the ecology of epiphytic plant pathogenic bacteria. Experience with the ice nucleation activity of *Pseudomonas syringae* during her training at UW-Madison and field observations she made about its presence in pristine alpine regions during a sabbatical at Montana State University have led her to develop a research program that integrates this bacterium's natural aquatic habitats and its causal role in atmospheric processes such as rain and snowfall into the epidemiology of the diseases it causes.